P.C.10

6.

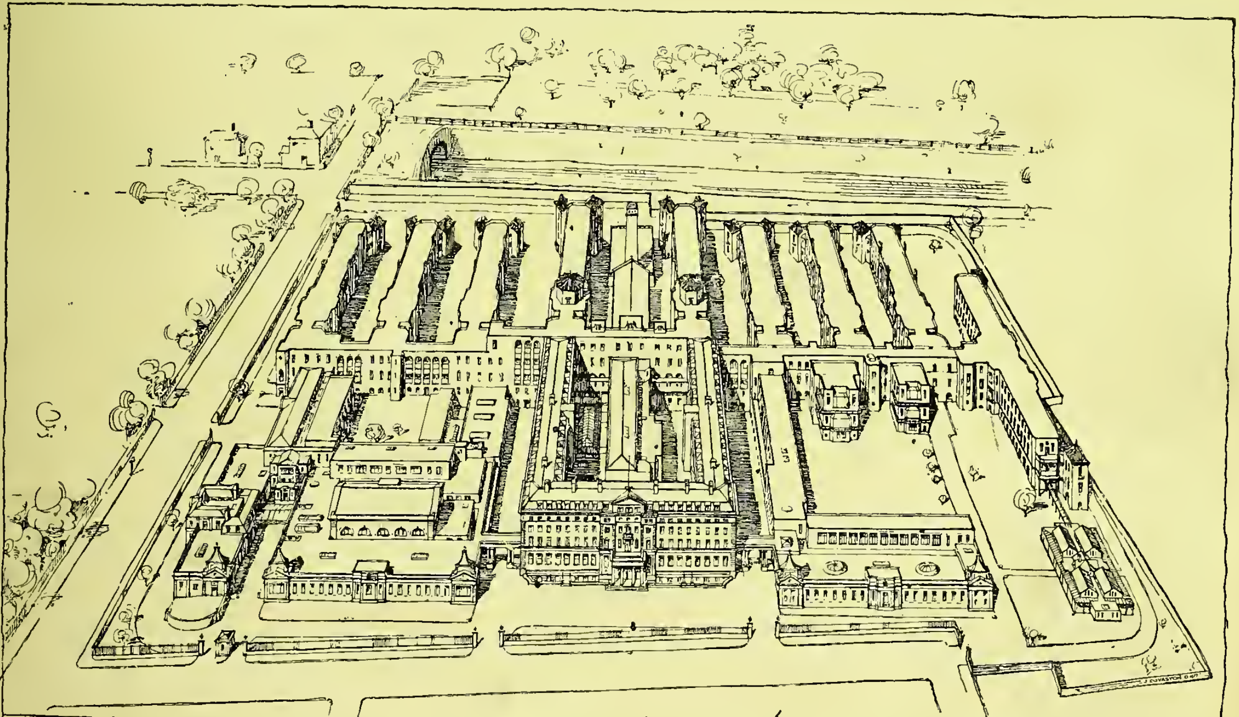
THE
HOSPITAL GAZETTE

The Official Journal of the
Incorporated Association of Hospital Officers.

ANUARY, 1914. PRICE (To Non-Members) ONE SHILLING and THREEPENCE (including Postage).

ROYAL COLLEGE OF SURGEONS OF ENGLAND
20 JAN 14
LIBRARY

Special Number Descriptive of THE NEW King's College Hospital.



···A·PROSPECT·of·KINGS·COLLEGE·HOSPITAL·-·DENMARK·HILL·LONDON·S·E·-··William·A·Pite·F·R·I·B·A·Architect·-·

FOR PARTICULARS OF THE
ONLY

Composition Flooring

USED THROUGHOUT

KING'S COLLEGE

HOSPITAL,

DENMARK HILL, S.E.,

APPLY TO THE

"DURATO"

Asbestos Flooring Co., Ltd.,

:: 26a, Soho Square, W. ::

Telephone : 2294 Gerrard. Factories : Union Hall, Union Street, Borough, S.E.

THE INCORPORATED ASSOCIATION OF HOSPITAL OFFICERS.

FOUNDED 1902. INCORPORATED 1910.

President:

Mr. Herbert H. Jennings, *Secretary*, Chelsea Hospital for Women.

Vice-Presidents:

Mr. Walter Alvey, *Secretary*, Charing Cross Hospital.
Mr. Lewis H. Glenton-Kerr, *Secretary*, Great Northern Central Hospital.
Mr. P. Michelli, C.M.G., *Secretary*, Seamen's Hospital Society.
Mr. J. Stephen Neil, *Secretary*, Wolverhampton General Hospital.
Mr. E. W. Morris, *Secretary*, London Hospital.
Mr. C. T. Walrond, *Consulting Engineer*, The Hospital for Sick Children, London; St. George's Hospital.
Mr. Alex. Hayes, *Secretary*, Metropolitan Convalescent Institution.
Mr. Thomas Hayes, *Clerk*, St. Bartholomew's Hospital.
Mr. Sydney Phillips, B.A., *Steward*, St. Thomas's Hospital.
Mr. F. W. Howell, *Secretary*, Cancer Hospital, London.
Mr. Thomas Ryan, *Secretary*, St. Mary's Hospital, Paddington.
Mr. A. Watkins, *Steward*, St. Bartholomew's Hospital.
Mr. C. W. Thies, Honorary Member.
Mr. Richard Kershaw, *Secretary*, Central London Throat, Ear and Nose Hospital.
Mr. Stewart Johnson, *Secretary*, Hospital for Sick Children, Great Ormond Street.

Council:

Chairman, Mr. Godfrey H. Hamilton, *Secretary*, National Hospital for the Paralysed and Epileptic.
Mr. R. Allen, *Secretary*, Royal Hospital, Richmond.
Mr. W. Bowe, *Assistant Secretary*, Royal Free Hospital.
Mr. F. P. Carroll, *Assistant Secretary*, Charing Cross Hospital.
Mr. A. H. Coughtrey, *Librarian*, St. Bartholomew's Hospital.
Mr. W. J. Davidson, *Secretary*, Grosvenor Hospital for Women.
Mr. A. H. H. Franklyn, *Secretary*, Royal Waterloo Hospital for Children and Women.
Mr. Spencer Johnson, *Secretary*, City of London Lying-in Hospital.
Mr. J. G. Oatley, *Surveyor*, London Hospital.
Mr. H. C. Staniland Smith, *Secretary*, Evelina Hospital for Children.
Mr. G. E. Town, *Pharmacist*, Evelina Hospital for Children.
Mr. P. L. Vaughan, *Assistant Secretary*, St. Luke's Hospital.

Representative of Manchester Branch:
Major Cyril Tyler, *Secretary*, Stockport Infirmary.

Elected Representatives of the Vice-Presidents:
Messrs. W. Alvey and Stewart Johnson.

Executive Officers:

(An asterisk denotes a member of the Council *ex officio*.)

Honorary Treasurers:

*Mr. G. A. Arnaudin, *Secretary*, St. John's Hospital for Diseases of the Skin.
*Mr. A. E. Thomas, *Secretary*, Hampstead General Hospital.

Hon. Auditor:

Mr. Lionel H. Lemon, Chartered Accountant, 32, King Street, Cheapside, E.C.

Hon. Editor "Hospital Gazette":

*Mr. Geo. Watts, *Secretary*, City of London Hospital for Diseases of the Chest.

Honorary Assistant Editor:

Mr. Godfrey H. Hamilton, *Secretary*, National Hospital for the Paralysed and Epileptic.

Honorary Manager:

Mr. W. J. Davidson, *Secretary*, Grosvenor Hospital, Vincent Square, S.W.

Honorary Advertisement-Manager:

(Vacancy).

Honorary Secretaries:

*Mr. Ian MacKay, *Assistant Secretary*, Chelsea Hospital for Women.
*Mr. W. J. Sheldrick, *Secretary*, Yarrow Convalescent Home.

Hon. Solicitor:

Mr. Harold Hargrove, 16, Victoria Street, S.W.

Objects of Association.

The promotion of Social intercourse among its members.

The discussion and study of matters affecting their interests, duties and responsibilities.

The reading and publishing of Papers upon Hospital work.

The arrangement of Saturday afternoon visits to Hospitals and other places of interest to Hospital officials.

The promotion of the general welfare of Hospital workers.

The establishment of an information and employment bureau.

Extracts from Rules.

The Association shall consist of Hospital Officers, and the Members shall pay a minimum subscription of 5s. per annum.

Members' subscriptions shall be paid upon joining, and at the commencement of each subsequent Session, and the Council shall have power to strike off the roll of the Association the name of any member whose subscription is three months in arrears.

The business of the Association shall be controlled by a Council . . . consisting of all the Executive Officers (except Auditors) and a Committee of twelve members, three of whom shall retire annually.

Nominations for membership shall be made and seconded in writing on the prescribed form by members of the Association, signed by the Nominee, and submitted to the Council for election.

Membership.

Applications for membership should be made to one of the Honorary Secretaries, 62 Chandos Street, W.C.; and for Manchester Branch (*see below*) to the Honorary Secretary, Mr. Herbert Burland, Royal Infirmary, Manchester.

THE MANCHESTER and DISTRICT BRANCH of THE INCORPORATED ASSOCIATION OF HOSPITAL OFFICERS.

FOUNDED 1908.

President:

Mr. Frank Oliver, *General Supt. and Secretary*, District Infirmary, Ashton-under-Lyne.

Vice-Presidents:

Mr. Walter G. Carnt, F.C.I.S., *Superintendent*, Manchester Royal Infirmary.
Mr. W. Shelley Prophet, *Secretary*, Manchester Royal Eye Hospital.
Mr. E. Lionel Blake, *Secretary and Supt.*, Royal Infirmary, Oldham.
Mr. Hy. J. Eason, F.C.I.S., *Secretary*, Manchester Children's Hospital.
Major Cyril Tyler, *Secretary*, Stockport Infirmary.
Mr. George Ruddle, *Secretary*, Salford Royal Hospital.
Mr. J. H. Shaw, F.C.I.S., *Secretary*, Southport Infirmary.

Council:

Mr. W. H. Butchers, M.P.S., Manchester Royal Infirmary.
Mr. George Keating, Manchester Royal Infirmary.
Mr. H. M. Massingham, M.P.S., Manchester Royal Infirmary.
Mr. R. D. Holt, Ancoats' Infirmary.
Mr. John Nall, Manchester and Salford Hospital for Skin Diseases.
Mr. Frank Oliver, Ashton-under-Lyne Infirmary.
Mr. Robert Ratcliffe, F.C.I.S., St. Mary's Hospital, Manchester.
Mr. Nathan Smith, Blackburn Infirmary.
Mr. Wm. Stevenson, F.C.I.S., The Devonshire Hospital, Buxton.

Hon. Secretary:

Mr. Herbert Burland, Manchester Royal Infirmary.

Hon. Correspondent *of "Hospital Gazette"*:

Mr. F. W. R. F. Stirke, Manchester Royal Infirmary.

Hon. Treasurer:

Mr. John Tonkinson, Salford Royal Hospital.

Hon. Auditor:

Mr. F. Grimshaw, *Accountant*.

ESTABLISHED 1871.

THE LIMMER ASPHALTE PAVING COMPANY, LTD.

CHIEF OFFICE:—Caxton House, Westminster, S.W.

KING'S COLLEGE HOSPITAL, DENMARK HILL, LONDON, S.E.

View showing a portion of the roof (with dome) covered with this Company's **Montrotier Seyssel Asphalte,** obtained from the Company's freehold mines in the Bassin de Seyssel (Haute Savoie), France.

APPROXIMATELY 30,000 YARDS SUPER LAID TO ROOFS, FLOORS AND CORRIDORS ON THE ABOVE BUILDING.

ASPHALTE WORK OF EVERY DESCRIPTION UNDERTAKEN AT COMPETITIVE PRICES.

FULLY EQUIPPED BRANCHES THROUGHOUT THE UNITED KINGDOM.

THE HOSPITAL GAZETTE, SPECIAL NUMBER.

Descriptive of the New King's College Hospital.

CONTENTS.

PAGE
Accommodation 5
Administration Department 6
Bathing Establishment 15
Bath Room, Fittings 23
Boiler House 26
Casualty Department 11
Chapel 21
Children's Section 14
Clinical Room, Fittings 23
Clocks (*see* Telephones and Clocks) 23
Contractors 23, 39, 43
Corridors 21
Dental Section 15
Detailed Description, Order of 6
Disinfecting Room and Foul Washing House 31
Dispensary 16, 34
Dispensary Waiting Hall 13
Doors 22
Drainage 40
Ear (*see* Throat, Nose and Ear Section) 15
Electrical Section 16
Electrical Supply 35
Engineering Description 24
Engine Room 27
Finish of Walls 22
Fire Mains 43
Fireplaces 22
Fittings, Clinical Room 23
Floorings, Staircases, etc. 21
Foul Washing House and Disinfecting Rooms 31
Gynæcological (*see* Women and Gynæcological Section) 14
Heating Plant 33
Hot Water Supply 35
Isolation Block 21
Kitchens 9, 32
Lifts 37
Linen Department 10
Materials 44
Medical School 21

Granite Silicon Plaster Company, Limited.

TRADE MARK.

ESTABLISHED 1892.

As supplied to His Majesty's Government.

Granite Plaster used throughout this Hospital.

Granite Plaster used throughout this Hospital.

ENTRANCE HALL, ADMINISTRATIVE BLOCK,
KING'S COLLEGE HOSPITAL.
Architect - - W. A. PITE, ESQ., F.R.I.B.A.

Telegrams:
"SWEETWATER," LONDON.

Telephone:
No. 1039 P.O. HAMPSTEAD.

Offices and Depôt:

34 & 36, King's Road, St. Pancras, N.W.

CONTENTS—*continued.*

PAGE

Medical Section . . . 14
Nose (*see* Throat, Nose and Ear Section) . . . 15
Nurses' Home . . . 6
Operation Theatres . . . 20, 34
Ophthalmic Department . . . 15
Ophthalmic Theatre . . . 20
Order of Detailed Description . . . 6
Out-patient and Casualty Department . . . 11
Out-patient Department . . . 13
Pathological and Post-mortem Department . . . 21
Plant, Description of . . . 26
Power Station, Central . . . 11
Precautions against Fire . . . 40
Pumping Plant . . . 29
Radiators . . . 23
Sanitary Towers . . . 19
Secretarial Department . . . 6
Site . . . 3
Soil Pipes . . . 42
Staircases (*see* Floorings, Staircases, etc.) . . . 23
Stores (System of Receipt and Distribution) . . . 10
Sub-Contractors . . . 23
Surgical Section . . . 15
System of Receipt and Distribution of Stores . . . 10
Telephones and Clocks . . . 23
Throat, Nose and Ear Section . . . 15
Ventilation . . . 38
Walls, Finish of . . . 22
Ward and Theatre Blocks . . . 16
Wards . . . 16, 34
Water Supply . . . 42
Windows . . . 23
Women and Gynæcological Section . . . 14

700 Gilmour Hospital Doors

in Plain White Oak, stained by us to represent Teak, have been used at

King's College Hospital.

Architect: WILLIAM A. PITE, ESQ., F.R.I.B.A.

GILMOUR PATENT HOSPITAL DOORS

are in use in the following:—

HOSPITALS in PROVINCES—

Royal Devon and Exeter Hospital
General Hospital, Bristol
Bow Arrow Hospital, Dartford, Kent
General Hospital, Ramsgate, Kent
Royal Berks Hospital, Reading
Ryde, I.O.W., Hospital
Eltham and Mottingham Cottage Hospital
Norwich Infirmary
Croydon Borough Hospital, Surrey
Bute Hospital, Luton, Beds.
Royal Bucks Hospital
St. Cross Hospital, Rugby
Goole Joint Infectious Hospital
Lincoln County Hospital
Dorking Isolation, Surrey
Billericay Union, Essex
Rochford Union, Essex
Children's Dispensary, Manchester
Blackley Infirmary, Manchester
Blackpool Hospital, Lancs.
Bradford Workhouse Infirmary
Derbyshire Royal Infirmary
Harrogate Infirmary
Ingham Infirmary, South Shields
Lying-in Charity, Birmingham
Manchester Royal Infirmary (984 Q.W.O.)
Ditto (C.B.) (103 Q.W.O. now in hand)
Mansfield Accident Hospital
Middlewich Hospital
Netley Hospital
Newmarket Hospital
New Dispensary, Manchester
Royal Portsmouth Hospital
Sussex County Hospital
Victoria Cottage Hospital, Hull
Wolverhampton Hospital
Coventry and Warwickshire Hospital
Cirencester Cottage Hospital
Bolton Infirmary (N.H.) (82 P.W.O. in hand)
Bury Hospital
Eastern Dispensary, Liverpool
Hove Dispensary
South Hants and Southampton Hospital
Staines Joint Hospital
Isolation Hospital, Earlestown, Lancs.
Chichester Infirmary
Ipswich Hospital Extension
Radcliffe Infirmary, Oxford
Earlswood Asylum, Redhill
Liverpool Royal Infirmary (100 Teak)
Royal Hospital, Sheffield
North Staffordshire Infirmary

HOSPITALS in SCOTLAND—

Samaritan Hospital, Glasgow
Cottage Hospital, Port Glasgow
Dykebar Asylum, Paisley
Hawkhead Asylum, Paisley
Merryflat Asylum, Glasgow
Royal Infirmary, Edinburgh
Royal Infirmary, Glasgow
Stobhill Hospital, Glasgow
Western Infirmary, Glasgow
Royal Hospital (Children), Glasgow (195 P.W.O.)
Thornton Joint Hospital, Kirkcaldy

HOSPITALS in WALES & MONMOUTH—

Gelligaer Isolation Hospital, Pengam
Cottage Hospital, Old Colwyn
Swansea Hospital (49 Mahogany)
Bridgend Isolation Hospital
Cardiff Asylum, Cardiff
Cottage Hospital, Margam
Also Melbourne Hospital (Australia) Hospital St. Gall, Switzerland, etc., etc.

LONDON and DISTRICT HOSPITALS—

London Hospital, Whitechapel, E.
Univ. College (Nurses' Home) (181 Teak)
Royal National Orthopædic (203 Birch)
Guy's Hospital (Teak)
Barkingside (G.V.) Hospital (69 Birch)
Ealing Hospital
Lock Hospital, Soho (Birch)
Women's Hospital, Soho
Middlesex (New Cancer Wing) (99 Q.W.O.)
Middlesex Hospital
East London Hospital
Hampstead and N.W. Hospital (P.W.O.)
Putney Hospital
St. Mary's Hospital, Plaistow (76 Birch)
Miller Hospital, Greenwich (83 P.W.O.)
German Hospital, Dalston
Samaritan Free Hospital, N.W.
Children's Hospital, Gt. Ormond St., W.C.
Seamen's Hospital, Greenwich
Royal Free Hospital, Gray's Inn Rd., W.C
Bolingbroke Hospital, Wandsworth
Invalid Gentlewomen's Hospital, N.W.
Metropolitan Hospital, Kingsland Rd., N.E.
Italian Hospital
City of London Lying-in, City Road, E.C.
Evelina Children's Hospital
Hornsey Hospital, Muswell Hill
London Temperance Hospital
Royal Natl. Pension Fund (Nurses' Home)
South Eastern Hospital
Tottenham Hospital
Edmonton Infirmary
British Home and Hospital, Streatham
Duchess Nursing Home, Marylebone
St. Pancras Infirmary
St. Mary's Hospital, Paddington
Weir Charity, Balham (83 Birch now in hand)
Willesden Parish Infirmary

THE GILMOUR DOOR is fire-resisting. The veneer is really a case of the primest hardwood, and not a thin paper veneer.

EACH DOOR IS GUARANTEED FOR TEN YEARS NOT TO SHRINK OR TWIST.

OFFICES AND NEW SHOWROOMS—

GILMOUR DOOR Co., Ltd., 51, Berners St., London, W.

Telephone—Gerrard 1741.

LIST OF ILLUSTRATIONS.

	PAGE
Administration Block	3
Bed Lift	37
Boiler House	26
Chapel	22
Calorifiers	22
Children's Ward	28
Cold Storage	18
Consulting Room	32
Dairy	11
Dispensary	32
Foul Washing House	16
Generating Plant	30
Hardware Store	36
Kitchen	10
Main Corridor	31
Main Switchboard	20
Mattress Disinfector	36
Night Nurses' Corridor	30
Nurses' Bath Room	8
Nurses' Dining Hall	7
Operation Theatre, Out-patients' Department	6
Out-patients' (and Casualty) Department	14
Out-patients' Waiting Hall	12
Refrigerating Plant	13
Scullery	28
Statue of the late Dr. Todd	31
Storage Battery	5
Telephone Exchange Room	27
Vestibule and Entrance Hall	29
Ward	4
Ward Kitchen	17
	19

LIST OF PLANS.

Bird's Eye View	Front Cover
Block Plan	2
Kitchen and Stores Departments	9
General Ward Block (all floors)	17
Power House	25

JAMES SLATER & CO. (ENGINEERS), LTD.,

50 & 51, Wells St., London, W.

Engineer Specialists in Hospital Apparatus.

KING'S COLLEGE HOSPITAL.

GAS OVENS Supplied by Slaters.

OUR GAS & STEAM COOKING APPARATUS

is too well known to need much advertisement. We have fitted up the whole of the kitchen at

King's College Hospital.
The London Hospital.
St. Bartholomew's Hospital.
Middlesex Hospital.
St. Thomas's Hospital.
Manchester Royal Infirmary.
Edinburgh Royal Infirmary.
Glasgow Royal Infirmary.
&c., &c.

HEATING,

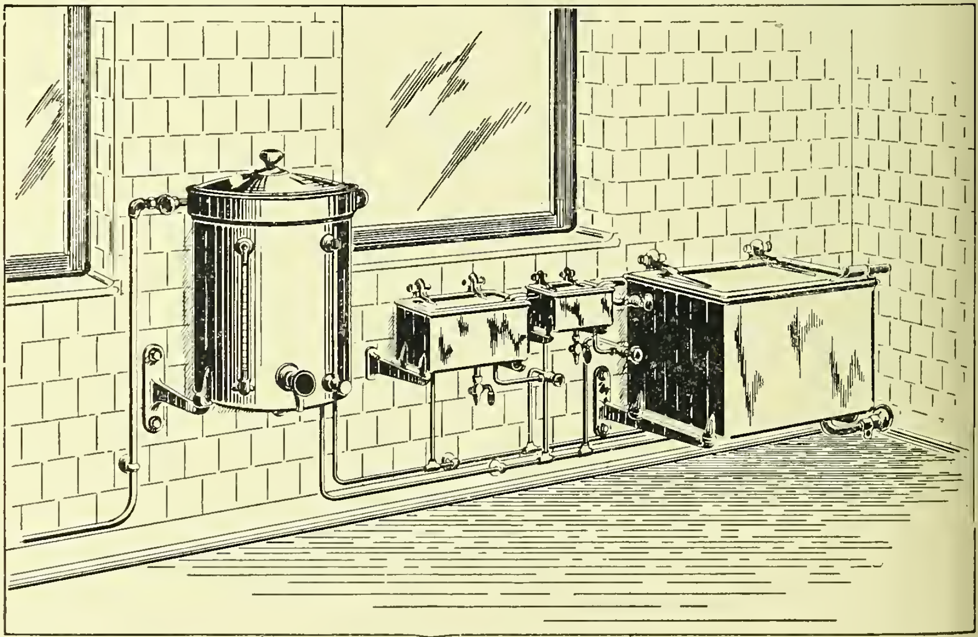
HOT WATER SUPPLY,

VENTILATION,

etc.

We make a great speciality of this, and are at present engaged upon the installation at the new King's College Hospital, etc.

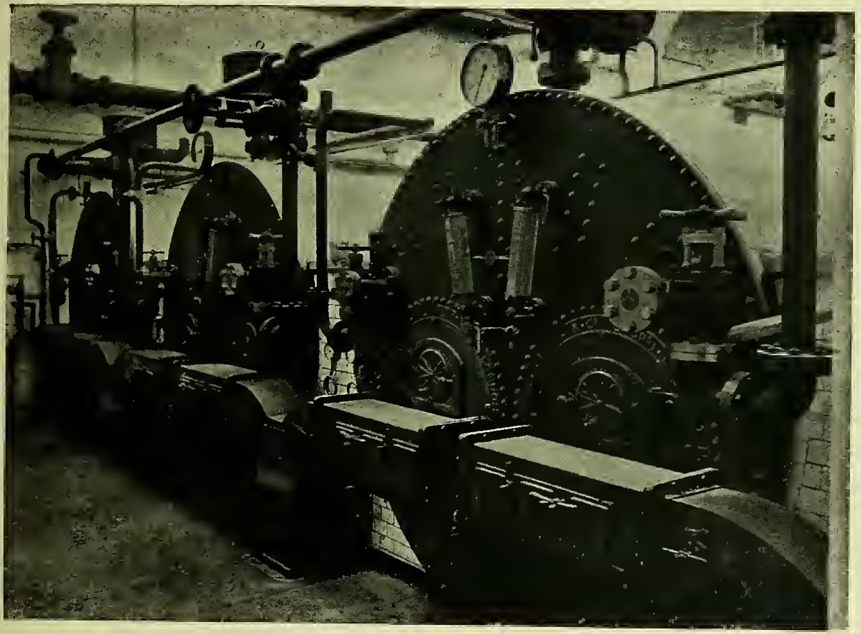
CATALOGUE on APPLICATION.



Sterilizers, as supplied to London Hospital, Middlesex Hospital, Manchester Royal Infirmary, etc., by Messrs. Slater.

KING'S COLLEGE HOSPITAL,

DENMARK HILL, S.E.

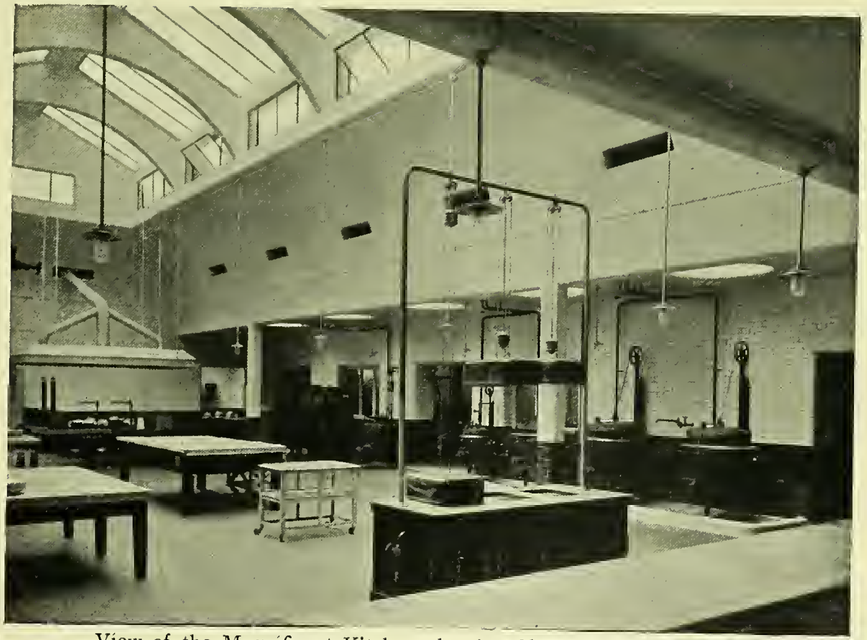


View of Central Steam Boilers.

Messrs. JAMES SLATER & CO. (Engineers), Ltd., have carried out the whole of the Engineering Works at the King's College Hospital in connection with :—

- CENTRAL STEAM BOILERS.
- HEATING.
- DOMESTIC HOT WATER SUPPLY.
- VENTILATION.
- GAS SUPPLY.
- MAIN KITCHEN.
- WARD KITCHENS.
- FUEL ECONOMISER.
- DUST DESTRUCTOR.

The magnitude of the Engineering Works carried out by Messrs. JAMES SLATER & CO. (Engineers), Ltd., at this Hospital, the high degree of design and workmanship, and the hygienic qualities, will impress all Architects, Engineers, and others who visit the Hospital, with the high qualifications of Messrs. JAMES SLATER & CO. (Engineers), Ltd., to carry out in the very best manner all contracts put into their hands.



View of the Magnificent Kitchen, showing Slater's Steam Cooking Apparatus, &c. Slater's Gas Roasting Ovens are on the wall on the left, and are shown in a picture on the opposite page.

JAMES SLATER & CO., Engineers, LTD.,

50 & 51, Wells Street, LONDON, W.

Telegrams: "Triad Ox, London." **Telephone: Regent 4540 (2 lines).**

AS USED AT KING'S COLLEGE HOSPITAL.

SPECIAL GLASS for glazing
HOSPITAL OPERATING THEATRES, WARDS, CORRIDORS, &c.

Perfect Screens, allowing full light to pass through, with smooth surfaces that will not attract bacteria.

WHITE ALABASTER GLASS SLABS,
ANY SIZE, FOR OPERATING TABLES,
WALL LININGS, &c., PERFECTLY ANTISEPTIC.

The same material is used for Shelves, Antiseptic Cupboards, Bath Rooms, Lavatories, &c., &c.

SUPPLIED BY THE MANUFACTURERS:—

THE LONDON SAND BLAST
DECORATIVE GLASS WORKS, Ltd.,
58A GRAYS INN ROAD, LONDON, W.C. 58A

DIRECTION TABLETS AND LETTERED SIGNS OF EVERY DESCRIPTION FOR WALL USE OR ILLUMINATION.

ENGRAVED AND ENAMELLED LETTERING ON CHEMICAL BOTTLES, JARS, & EVERY VESSEL USED IN HOSPITALS, &c.

HOSPITAL GAZETTE.

Special Number describing the

New King's College Hospital.

Single Copies, **1/3** post free, may be obtained from the Honorary Manager,

Mr. W. J. DAVIDSON, Grosvenor Hospital, Westminster;
or from
Mr. H. A. JONES, 85, Fleet Street, London, E.C.

Telephone Number: City 8638.

ALLIANCE

ASSURANCE CO., LTD.

ESTABLISHED IN 1824.

Head Office: Bartholomew Lane, London, E.C.

Assets Exceed £23,500,000.

DIRECTORS—

The Right Hon. LORD ROTHSCHILD, G.C.V.O., *Chairman.*

Ian Heathcoat Amory, Esq.
Charles Edward Barnett, Esq.
F. Cavendish Bentinck, Esq.
A. V. Dunlop Best, Esq.
Francis Augustus Bevan, Esq.
Percival Bosanquet, Esq.
Hon. Kenelm P. Bouverie.
Thomas Henry Burroughes, Esq.
John Cator, Esq., M.P.
Lord Dalmeny. [G.C.V.O.
His Grace The Duke of Devonshire,
Col. The Hon. Everard C. Digby.

Hugh H. J. W. Drummond, Esq.
Captain Gerald M. A. Ellis.
C. Shirreff Hilton, Esq.
W. Douro Hoare, Esq.
Francis Alfred Lucas, Esq.
Cecil Francis Parr, Esq.
Hon. Henry Berkeley Portman.
Hon. N. Charles Rothschild.
Sir Marcus Samuel, Bart.
H. Melvill Simons, Esq.
Henry Alexander Trotter, Esq.
Right Hon. The Earl of Verulam.

Sir Charles Rivers Wilson, G.C.M.G., C.B.

Business transacted by the Company:—

(1) **Life Insurance,** with and without Profits, with special Provisions for the payment of Estate Duties.

(2) **Fire Insurance** of every description.

(3) **Insurances to cover Loss of Rent, Interest and Profit** consequent upon Fire damage to property.

(4) **Marine Insurance.**

(5) **Burglary, Theft and Plate Glass Insurance.**

(6) **Accident,** including Personal Accident, Motor Car, and Employers' Liability Insurance.

Fidelity Guarantee and Sinking Fund Policies are also granted.

Applications for Agencies are entertained, and Prospectuses, with other papers, may be had on written or personal application.

ROBERT LEWIS, General Manager.

By Appointment
to H.M. The King.

POLISHED FLOORS.

By Appointment
to H.M. Queen
Alexandra.

RONUK, Ltd.

are prepared to Estimate for the Polishing and the maintenance of all kinds of floors in

**HOSPITALS, INSTITUTIONS
AND PRIVATE HOUSES.** *Write for Pamphlet.*

Manufacturers of **"RONUK," SANITARY POLISH.**

Awarded Gold Medal at XVIIth International Congress of Medicine, and Six Medals by the Royal Sanitary Institute, including the Highest and only Awards ever granted to a Polish.

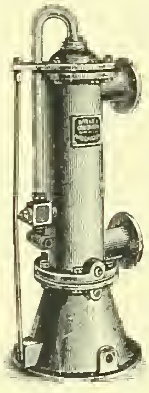
"RONUK," Ltd., Head Office and Factory, **Portslade, Brighton, Sussex.**
Depôts—LONDON: 16, South Molton Street, W. MANCHESTER: 285, Deansgate.

CALORIFIERS

(ROW'S PATENT)

for heating

BUILDINGS and BATH WATER.



Copious Supplies, Uniform Temperature.

**AUTOMATIC
STEAM CONTROL.**

Water Softening and Filters.

**Steam Traps, Reducing Valves,
Feed Water Heaters, &c.**

We shall be pleased to give
MEDICAL OFFICERS
full particulars and advice respecting
:: the ordering and working of these ::
Important Appliances.

ROYLES LIMITED, Engineering Specialists,
IRLAM, MANCHESTER.

Organs for Hospitals.

Norman & Beard, Ltd.

By Royal **Appointment.**

Builders of the Organs at:

King's College Hospital.
Middlesex Hospital.
Norfolk and Norwich Hospital.
City of London Mental Hospital, etc.

These Organs are noted for their pure and refined quality of tone.

Address: **NORMAN & BEARD, Ltd.**
61, Berners St., London, W., and Organ Works, Norwich.
Telephone Nos.: 9145 Gerrard; 294 Norwich.

Standard of the World :: ::

Over 60,000 in use.

OTIS ELEVATORS

ELECTRIC, HYDRAULIC, HAND-POWER, BELT, Etc.

for HOTELS, OFFICE BUILDINGS, RESIDENCES, HOSPITALS, STORES, WAREHOUSES, and all Situations requiring efficient transport of Passengers or Goods. :: :: ::

HOSPITALS using OTIS LIFTS include:—

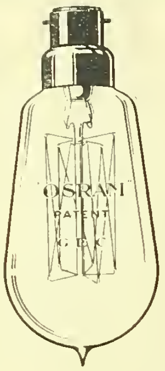
In LONDON—

	Number of Elevators.
King's College (new) Hospital	10
St. Thomas' Hospital	5
Charing Cross	3
Middlesex	5
Guy's	6
University College	2
Mount Vernon, Hampstead	3
Mount Vernon, Northwood	2
Central London Throat and Ear	1

and are in use in many HOSPITALS and INSTITUTIONS in the PROVINCES and ABROAD.

BRANCHES IN
PRINCIPAL CITIES.

Head Office:
OTIS ELEVATOR CO., Ltd.,
4, Queen Victoria Street, London.



OSRAM

DRAWN WIRE LAMPS

are to be found in nearly all leading Hospitals and similar Institutions, for it is in such places that every penny is of the greatest value. Practical experience has proved that by the exclusive use of OSRAM DRAWN WIRE LAMPS

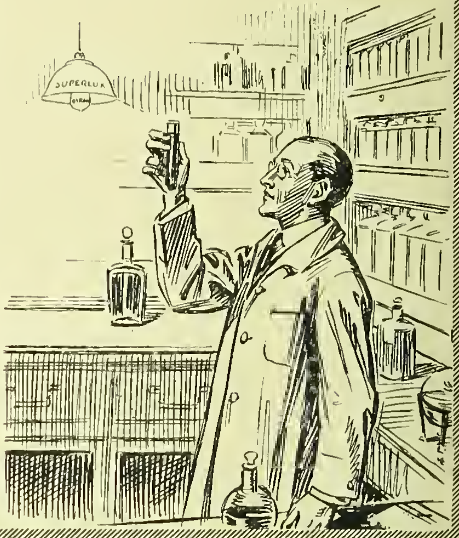
ECONOMY is best practised, for with exceedingly low curren consumption, they reduce electric light bills to a minimum, and yet give forth a light of perfect

BRILLIANCY of invaluable assistance to Doctors, Nurses and Dispensers, whilst it should also be remembered that OSRAM light is soft and steady and so does not try the eyes of the patient.

Sold by all leading Electricians, Stores, Ironmongers, etc.

WHOLESALE ONLY:

THE GENERAL ELECTRIC Co., LTD.,
67, Queen Victoria Street, LONDON, E.C.



CARRON

By Appointment
Ironfounders
to H.M The King

COOKING APPARATUS

CARRON Company's Cooking Apparatus, installed in many of the leading Hospitals throughout the kingdom, reach a very high standard of excellence —the natural outcome of the Company's long experience and vast manufacturing resources.

¶ Constructed for Coal, Coke, Gas, Steam or Electricity, they give a service eminently suited to the varied dietary of large hospitals and the like.

¶ The following are a few of the hospitals equipped with Carron Cooking Appliances:—

ROYAL CHELSEA HOSPITAL INFIRMARY. MILE END INFIRMARY.
TAUNTON HOSPITAL. ROYAL VICTORIA HOSPITAL, BELFAST.
LEEDS INFIRMARY. INVERNESS INFIRMARY, and others.

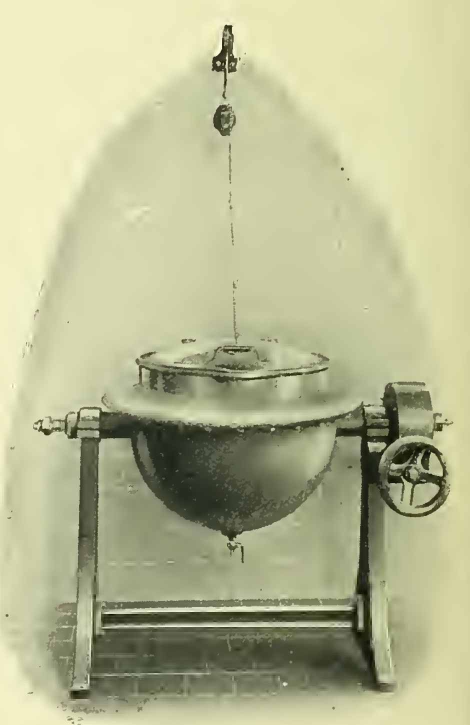
¶ Carron Company are always pleased to specify for any style, size or combination of Cooking Apparatus on receipt of plans or particulars.

ILLUSTRATION shows **No. 26P Steam Jacketted Pan,** with outer jacket and cast-iron inner pan, supported on heavy standards prepared for bolting to floor, and having cross stays and rests on turned trunnions cast on jacket, which are bored and fitted with swivel connections for steam and condense. Tilted by means of protected worm gearing, with hand-wheel. Cover is of planished copper, tinned inside and polished outside, with wall bracket, pulley, balance-weight and brass chain. Made any size.

Send for No 60a Cooking Apparatus Catalogue free on request.

CARRON COMPANY
CARRON, Stirlingshire.
And at Phœnix Foundry, Sheffield.

Showrooms: London (City), 15, Upper Thames Street, E.C.; (West End), 23, Princes Street, Cavendish Square, W.; and 3, Berners Street, W. Liverpool, Manchester, Bristol, Birmingham, Newcastle-on-Tyne, Edinburgh, Glasgow and Dublin.



THE TEALE FIREPLACE CO., LTD.,
Leeds and London.

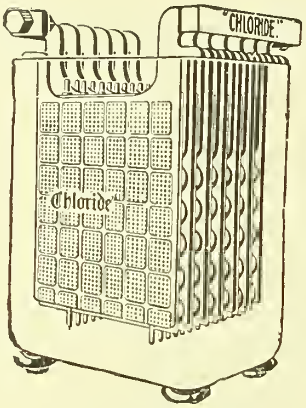
Photograph taken at King's College Hospital, Denmark Hill. Architect, W. A. Pite, Esq., F.R.I.B.A.

The Teale Fireplace Co., Ltd., have supplied fireplaces to the following Hospitals amongst many others:—

KING'S COLLEGE HOSPITAL. W. A. Pite, Esq., F.R.I.B.A., Architect.
MILLER GENERAL HOSPITAL. Messrs. Young & Hall, Architects.
BARKINGSIDE INFIRMARY. W. A. Pite, Esq., F.R.I.B.A., Architect.
LONDON HOSPITAL. Rowland Plumbe, Esq., F.R.I.B.A., Architect.
THE ROYAL LONDON ORTHOPÆDIC HOSPITAL. Rowland Plumbe, Esq., F.R.I.B.A., Architect.
THE CITY OF LONDON LYING-IN HOSPITAL, CITY ROAD. M. E. Collins, Esq., F.R.I.B.A., Architect.
BOLINGBROKE HOSPITAL. Messrs. Young & Hall, Architects.
DERBY ROYAL INFIRMARY. „ „ „
VICTORIA HOSPITAL FOR CHILDREN. Messrs. Young & Hall, Architects.
Etc., Etc., Etc.

THE TEALE FIREPLACE CO., LTD., Manufacturers to H.M. the King.

LONDON SHOWROOMS: 28, Berners Street, London, W. 'Phone 6792 Central.
LEEDS SHOWROOMS: 38, Cookridge Street, Leeds. 'Phones 618 and 619 Central.
Telegrams: "Teale, Exeter Place, Leeds."



We have supplied the battery at

KING'S COLLEGE HOSPITAL

and many of the leading Hospitals, Asylums and Public Institutions throughout the country. Our illustrated Circular 28, giving brief particulars of our experience in this class of work will be sent post free on application.

WE ALSO SUPPLY PORTABLE BATTERIES

for X-ray work, cautery, and general medical work, electric ignition and motor car lighting. Electric hand lamps for use in wards, weight only 3 lbs. giving two candle-power for 15 hours. Our patent wood separators enable the cells to retain their charge on open circuit many months.

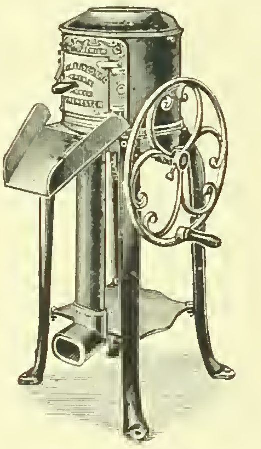
SEND FOR OUR CATALOGUE 85.

THE Chloride ELECTRICAL STORAGE Co. LIMITED

CLIFTON JUNCTION,
MANCHESTER.

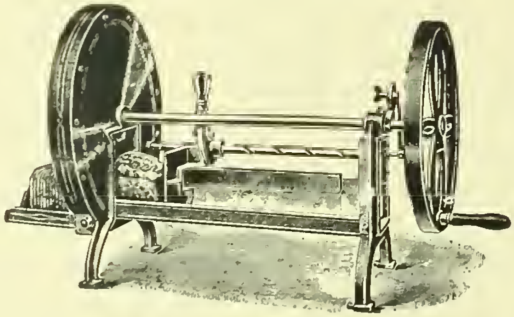
LONDON OFFICE:
39, VICTORIA STREET.

POTATO PEELING MACHINES.



CAPACITY 300 lbs. PER HOUR.

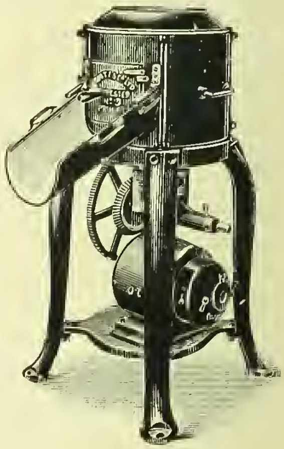
Price, £5.



Bread Cutting Machine.

AUTOMATIC LOAF CARRIER. PROOF AGAINST ALL POSSIBLE CHANCE OF ACCIDENT.

Price - - - £5 10s. 0d.



CAPACITY 800 lbs. PER HOUR.

Price with Motor and Starter, £27.

We have over 2,000 Machines in daily use.

Send for our Illustrated List of Caterers' Time and Labour Saving Appliances.

MABBOTT & Co., Ltd., PHŒNIX IRON WORKS, **MANCHESTER.**

LONDON SHOW ROOMS, 37/39, OLD STREET, E.C.

ELECTRICAL EQUIPMENT FOR HOSPITALS.

ALL TYPES OF TELEPHONE APPARATUS, SILENT ELECTRIC
CLOCKS, SIGNALLING APPARATUS, BELLS, ETC., ETC.

Automatic Table Instrument as supplied to King's College Hospital.

SPECIALITY:

Automatic Telephone Systems

as supplied to the

KING'S COLLEGE HOSPITAL, LONDON.

EXPERT ADVICE AND ESTIMATES FREE.

SIEMENS BROTHERS & CO., LTD., WOOLWICH, LONDON, S.E.

DURESCO

THE KING OF WATER PAINTS.

The FIRST in the Field. The FOREMOST ever since.

Recognised as the Water Paint of the Highest Standard.

Sole Manufacturers and Patentees:

THE SILICATE PAINT CO.,

J. B. ORR & CO., Ltd.,

CHARLTON, LONDON, S.E.

HOSPITALS & GENERAL CONTRACTS Coy., Ltd.,
SURGICAL INSTRUMENT MAKERS ETC.,

WARD LOCKERS.

THE
COMPLETE EQUIPMENT
OF
Hospitals,
Nursing Homes,
Dispensaries,
Consulting Rooms,
etc.,
A SPECIALITY.

Estimates Free.

INSPECTION OF SHOWROOMS INVITED.

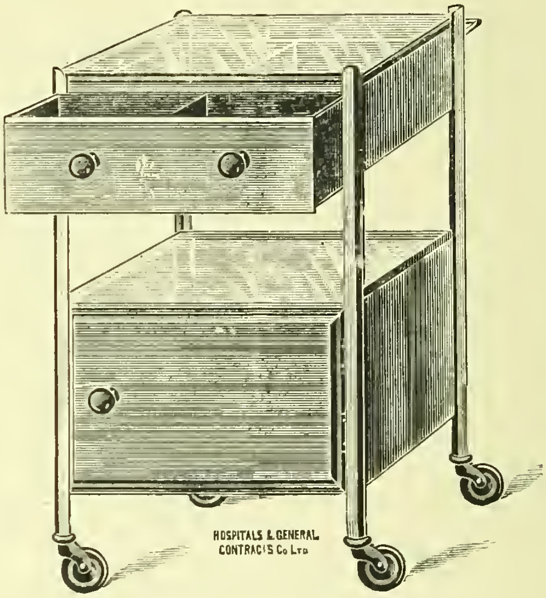

HOSPITALS & GENERAL CONTRACTS Co Ltd

Fig. 5090.

ASEPTIC WARD LOCKER.

White enamelled iron with drawer and Cupboard. Fitted with two ¼-in. plate glass shelves (plain or glazed).

On rubber-tyred Castors, size 16 × 16 × 32. **35/6**

TELEGRAMS "CONTRACTING LONDON." TELEPHONE 5840 GERRARD 2 LINES
25-35 MORTIMER STREET, LONDON. W.

NOTICE.

HOSPITALS & GENERAL CONTRACTS CO., LTD.

25-35, MORTIMER STREET, LONDON, W.

Telegrams: "Contracting, London." *Telephones: Gerrard 5840.*

THIS Company has been thoroughly reorganised, its Showrooms have been rearranged and extended, and its Stock replenished so as to include all kinds of Surgical Instruments, Furniture and Dressings.

Everything required by Hospitals and Medical Men is supplied at the Lowest Prices compatible with quality.

In case of any customers being dissatisfied a great favour would be conferred if they at once communicate by letter with the Managing Director.

DON'T ORDER PAINT! ORDER

PARIPAN

For Hospitals, all Institutions and House Decoration.

Ward showing the beautiful effect of Paripan, Glossy and Flat on all Walls, Ceilings and Woodwork.

PARIPAN is a Lacquer-Enamel, Artistic, Light-reflecting, Washable and Sanitary. May be washed with the usual disinfectants, therefore ideal for Operating Theatres and Laboratories.

Supplied in GLOSSY or FLAT (Dull).
Both washable—in White and all colours.
For Walls (bare plaster or already painted), Woodwork, Ceilings, Radiators, Baths, and everywhere in place of paint or distemper.

PARIPAN has just been used throughout the new Toronto General Hospital (see photo of ward), and is in many hundreds of Hospitals, Infirmaries, Sanatoria, etc., throughout this country, Canada, India, Africa, Australia, West Indies, etc.

THE NEW KING'S COLLEGE HOSPITAL.

The whole of the Hospital is treated throughout with PARIPAN—Corridors, Wards, Rooms, Chapel, Dispensary, Laboratories, Kitchens, Nurses' Rooms, Board Room, Laundry, etc. This includes Plaster, Woodwork and Joinery.

NO OTHER PAINT OR ENAMEL OF ANY DESCRIPTION HAS BEEN USED.

For the guidance of those who may visit the Hospital, and of Architects, the following details will be useful:—

The Paripan Process has been used throughout—that is, Paripan entirely for priming, undercoating and finishing.

WALLS OF CORRIDORS, ETC., ETC.—Two coats Paripan Filler, one coat Paripan Undercoat, one coat Paripan Glossy in a special Ivory tint.

WARDS.—Two coats Paripan Filler, one coat Paripan Undercoat, one coat Paripan Semi-Gloss, special Duck-egg Green.

CHAPEL.—Two coats Paripan Filler, one coat Paripan Undercoat, one coat Paripan Flat (Dull).

BOARD ROOM.—Two coats Paripan Filler, one coat Paripan Undercoat, one coat Paripan Semi-Gloss Ivory.

N.B.—Leading authorities have conclusively proved Paripan (four and five coat work) cheaper than distemper in the long run.

Illustrated Booklet, Hospital Reports, Colour Chart, Decorative Guide, Specimens, etc., free on request to the sole makers:—

RANDALL BROS., Hospital Dept.,
SHERWOOD HOUSE, PICCADILLY CIRCUS, W.

THE HOSPITAL GAZETTE.

Special Number Descriptive of the New King's College Hospital.

ROYAL COLLEGE OF SURGEONS OF ENGLAND
20 JAN 1
LIBRARY

PREFACE.

The construction of a Hospital undoubtedly represents one of the highest examples of applied science. Certain axioms, established by experience, supply a nucleus of the plan, but the art of the architect finds a wide range of expression in relation to the problems of reconciliation of the area, shape and levels of the site with the various requirements of accommodation, cost, and conditions of upkeep. The success of the project is greater when attained under the disabilities of town conditions. It is easy to prescribe the limits of cost of building; but the responsibility is upon the architect to adapt his schemes to both the natural conditions and those imposed by authorities; he must, through all his plans, maintain a link between economy in cost of building and that efficiency combined with economy in the everyday maintenance of the Hospital when completed which is the real criterion of success. Problems of no less seriousness face the expert advisers on engineering requirements. The greater the scale and the more varied the requirements, the greater is the achievement.

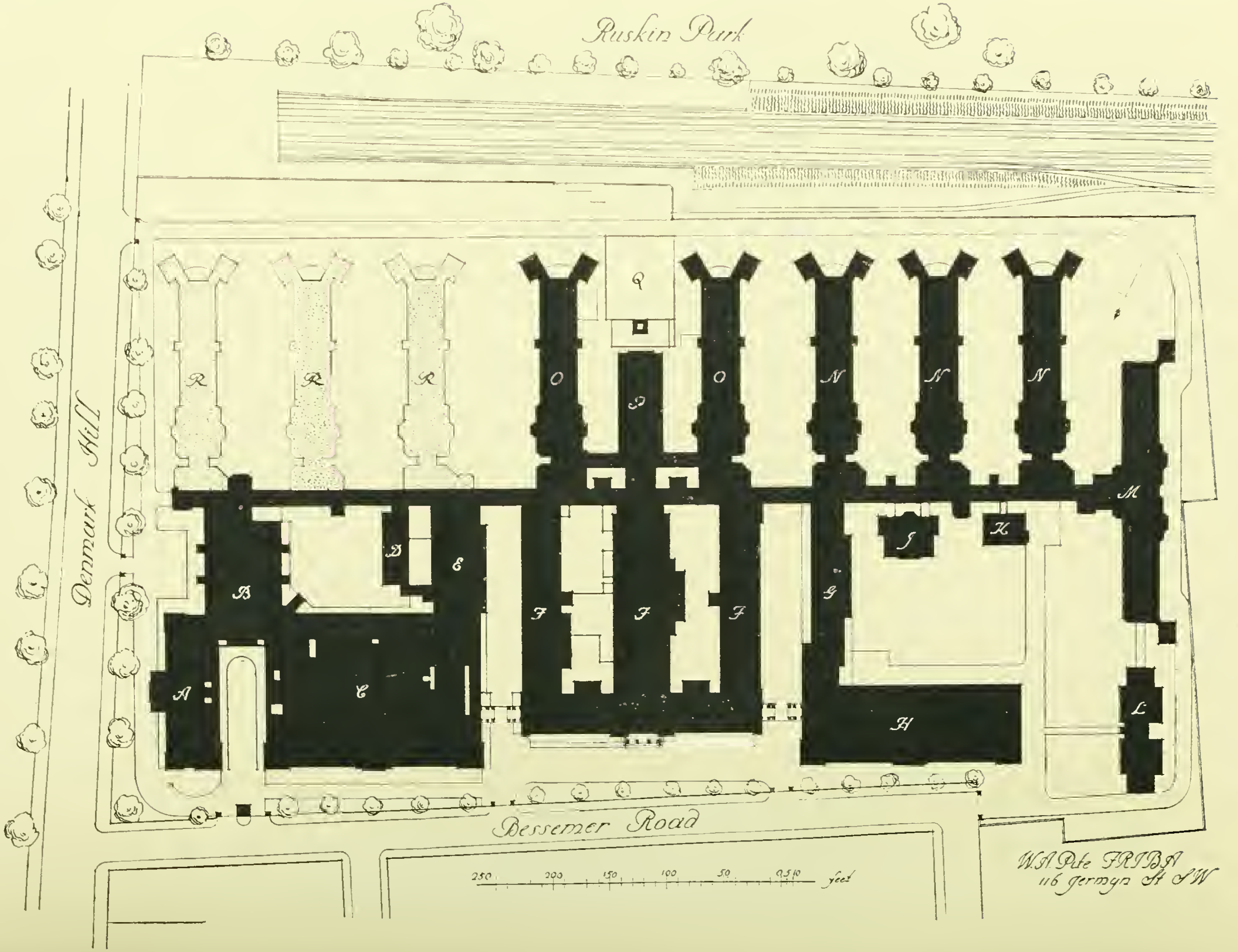
It is by reason of these facts, and the value attaching to an example of a large Hospital built with an ideal of combining the highest degree of efficiency, despite restrictions caused by the conformation of the site, with a not unduly elaborate exterior, that this special issue of The Hospital Gazette is published. It is a considerable number of years since a new Hospital on so large a scale has been erected in London, and although extensive additions have been made to many institutions in the last two decades, it is certainly beyond question that the new King's College Hospital offers the most convenient opportunity of study by all interested in Hospital work—whether they be members of committee, the medical profession or other officers of Hospitals—of modern Hospital construction.

This account has been prepared partly from personal observation, and does not pretend to be an exhaustive one. Our thanks are due to Mr. William A. Pite, F.R.I.B.A., the Architect, for his kindness in supplying materials for the architectural description; similarly, to Professor Capper, M.A., M.Inst.C.E., Inst.Mech.E., M.I.E.E., of the firm of Messrs. Kirkland and Capper, Consulting Engineer for the work, who has been responsible for the designing of a large portion of the apparatus specially to meet the requirements; to Mr. Charles T. Walrond, A.M.Inst.C.E., for his clear description of the drainage and water supply, and installations; and also to the Board of Management of the Hospital and Captain Tunnard, the Secretary, for their courtesy in giving permission for the photographing of the various departments.

The Editor.

KING'S COLLEGE HOSPITAL BLOCK PLAN.

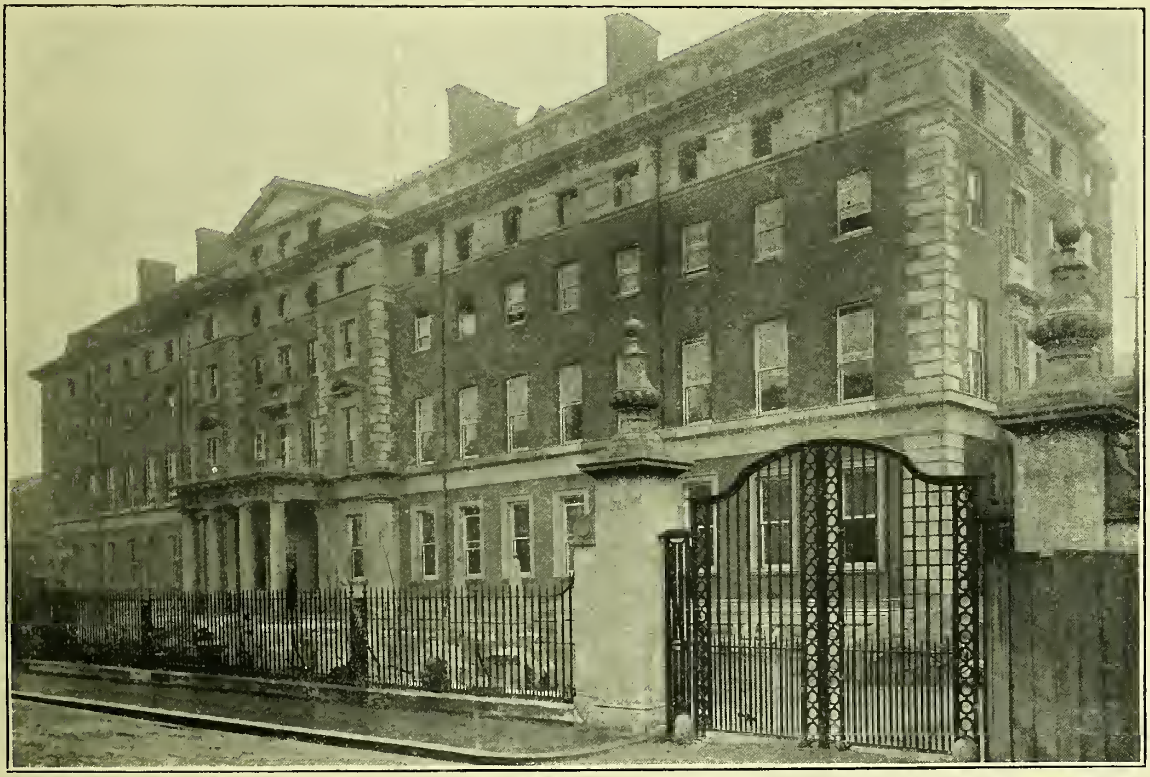
A	Casualty Department.
B	Baths and Electrical Department.
C	Out-Patient Department
D	Almoner.
E	Dispensary.
F	Administration Block.
G	Pathological and Post Mortem Block.
H	Medical School.
J	Operation Theatres.
K	Gynaecological and Clinical Theatres.
L	Isolation Block.
M	Special Ward Block.
N	Two-Storey Ward Blocks.
O	Three Storey Ward Blocks.
P	Chapel.
Q	Central Station.
R	Ward Blocks, future extension.



ROYAL COLLEGE OF SURGEONS OF ENGLAND
20 JAN 1

ARCHITECTURAL DESCRIPTION.

The general architectural character of the building is a phase of the English Renaissance, being of Georgian type. The grouping of the buildings on the two principal fronts dominates the general external effect, and, although purely ornamental detail has been avoided, the notes of dignity, and stability have been secured by the massing of the buildings and their sky lines.



ADMINISTRATION BLOCK.

The fabric is of dark, well-burnt, London stock brick, dressed with Portland stone and relieved with red brick cornices, bands and architraves. The roofs are covered with Westmoreland green slate, the flat ones with asphalt. The artistic treatment of the Administration Block has been emphasised by a more liberal use of Portland stone dressings than is the case elsewhere, and the brickwork of the upper storeys forms an agreeable foil to the masonry on the lower floors.

The Out-patient Department and the Medical Schools, flanking the main block on each side, have been designed generally in accord with one another, the symmetry of the entire front thus being secured.

The front to the main road (Denmark Hill) has a natural advantage of situation. The various groups of building viewed at this point rise one above the other, the Administration Block and other high points attracting the eye and contributing to a picturesque and pleasing group of buildings.

SITE.

The site has an area of 12 acres; the present buildings cover 3¾ acres, and when the scheme is completed the buildings will occupy 4½ acres. The Casualty, Out-patient, Bathing and Dispensary blocks represent about one acre. As the block plan indicates, the site is roughly oblong in shape, with the narrower frontage to the main road and a full length frontage on the side open to the road running at right angles from the main road, namely, Bessemer Road. It is bounded on the other side by the line of the London, Brighton and South Coast Railway, across which a pleasant view of Ruskin Park is obtained, an outlook which will be much appreciated by the patients using the sun balconies situated at the southern extremity of each floor of the ward blocks between the flanking sanitary annexes. These annexes act as screens against the east and west winds.

The conformation of the site has naturally been the deciding factor in the general plan of the buildings. It has allowed of the grouping of the various blocks in the most convenient manner, the Casualty Department in juxtaposition to the main road, the Out-patient Department next in position, and both connecting with the principal corridor, giving easy access to the ward blocks. Next in position (omitting detailed reference at this point to the kitchen, which is of one storey built on the lower ground level) and occupying the centre of the longer frontage, is the Administration Block, this, too, connecting directly with the principal corridor.

The main ideas governing the general plan are centralisation and radiation, the guiding principles being the most desirable aspect for patients, accessibility, and the most suitable gradients to allow of patients being quickly conveyed to any department with avoidance of stairs and contact with administrative departments.

VESTIBULE AND ENTRANCE HALL.

An examination of the block plan (page 2) will show that inclined passages from the Casualty and Out-patient Departments give directly on the principal corridor. The first floor of the Administration Block leads also directly to this point. This block, containing the whole of the accommodation for the Nursing Staff, is excellently situated for convenience in passage for the nurses to the wards. The use here of the lower level of the site to provide at the ground level all the secretarial and similar administrative departments (including some part of the nursing accommodation) is one of the fundamental points of the plan. As is shown by the plan referred to above, the principal corridor, with which all the blocks connect, is of considerable length, and practically divides the ward blocks, situated on the south side, from the other portions of the Hospital. On the same side and conveniently placed opposite the Administration Block is the Chapel.

No entrance lodge has been provided, excepting to the Out-patient (and Casualty) Department. The principal entrance doorways give admittance to a spacious and dignified hall, which has been dealt with in a simple and effective manner. To the left is the Secretarial Department and the Board Room, and other departments are on the right.

Accommodation.

When completed, the Hospital will have accommodation for 600 patients, with 300 nurses and other Staff numbering 100, making a total population of 1,000. Some idea of the magnitude of the work involved may be gained with the knowledge that there are over two miles of electric mains and sub-mains, the electric lamps making a total of 93,608 candle-power; that the heating of the building involves no less than eighteen miles of steam piping and more than 1,000 radiators; and that the hot-water service extends to seven miles of piping.

The foundation stone was laid by King Edward VII. on July 20th, 1909, and the inauguration of the building, although it was not then completed, was performed by His Majesty King George V. (who was accompanied by Her Majesty the Queen) on July 26th, 1913.

STATUE OF THE LATE DR. TODD.

In the lobby of the main entrance is a tablet on the wall bearing the inscription:—

> "William Henry Smith Memorial Building. In memory of the Right Honourable William Henry Smith, M.P., First Lord of the Treasury, a Member of the Committee of Management of King's College Hospital from 1849 to 1874, and a Vice-President from 1874 until his death in 1891."

A statue to the late Dr. Todd (who was for many years associated with the Hospital), removed from the Hall of the old Hospital, has been erected in the Hospital Grounds, facing Denmark Hill.

ORDER OF DETAILED DESCRIPTION.

Starting with the Administration Block (including the Nursing Department) the most convenient order of a description in detail of the various departments is as follows:—

- Administration Department (Secretarial).
- Nursing Staff Accommodation.
- Kitchen.
- Stores (Including Dispensary).
- Power House.
- Casualty Department.
- Out-patient Department.
- Dispensary.
- Ward Blocks.
- Operation Theatres.
- Special Block—Ophthalmic, Throat, Nose, Ear, and Skin.
- Medical School.
- Pathological and Post Mortem Departments.
- Chapel.

NURSES' DINING HALL.

The particulars from the engineering standpoint will be found in the special descriptions of those features in separate divisions, but reference will be made to some points of equipment in the course of this general account.

ADMINISTRATION DEPARTMENT (SECRETARIAL, ETC.) AND NURSES' HOME.

The Ground Floor contains the Secretary's Department, Board Room, and Resident Medical Officer's quarters, approached from the main entrance, the latter being self-contained and so separated from the other residential quarters. There is a separate entrance for nurses, at the left side of this centre block, with vestibule, female porters' office, hall, and a room for nurses to receive their visitors.

A cloak room with washing accommodation for the nurses is provided in order to obviate the necessity of their going to the upper floors when returning from the wards or after "off-duty."

Other accommodation on this floor consists of:—

A dining hall, 63 feet long by 29 feet, with 7 feet bay nearly whole length of one side, entered off stair hall, communicating with sitting-room and bedroom floors above by a spacious staircase or by electric lift.

Nurses' dining-hall. This has a panelled dado in teak. At the end of the hall is a serving hatch with roller shutter from the service room.

A service room, with lifts from kitchen adjoining.

Staff nurses' sitting-room, 26 feet by 21 feet.

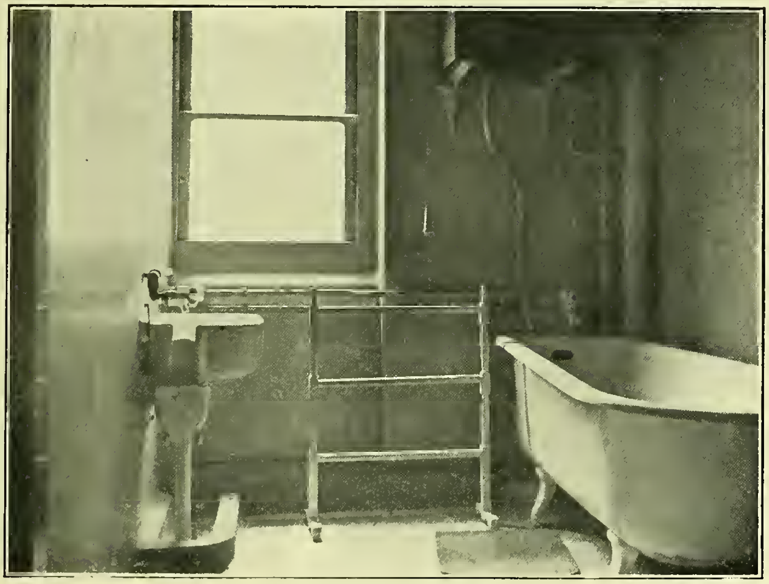
Probationers' sitting-room, same size, one on each side.

Writing-room, 27 feet by 21 feet, adjoining.

Matron's suite, consisting of dining-room, sitting-room, bedroom, bath and lavatory, all entered off private corridor connecting to principal corridor.

Housekeeper's suite, similar to the above described, but without dining-room.

Class-room, 41 feet 6 inches by 27 feet 9 inches, side and top lift. This room has accommodation for instruction in sick-room cookery.



NURSES' BATH ROOM.

Two smaller mess rooms (including the sisters'), 43 feet by 21 feet and 28 feet 6 inches by 21 feet respectively, also with service room and lift adjoining, entered from vaulted corridor connecting main dining-hall with another stair, with lift serving all floors.

First Floor.—This is the floor of organisation and administration, from which all the wards are worked.

The matron's, sisters' and nurses' quarters are on this floor.

There is a special staircase for the matron and her staff, with a similar one for servants on the opposite side of the block.

Other accommodation on this floor consists of:—

Sitting-room, 50 feet by 22 feet, with fireplaces at each end and radiators. Doors leading on to balcony, 26 feet by 9 feet, over principal entrance portico.

Matron's, assistant matron's, typists' and general offices.

Sisters' sitting-rooms, 17 feet by 12 feet—three in number.

First, Entresol, Second, Third and Fourth Floors.

Bedrooms, size 12 feet by 9 feet. Each room contains extract flue connected to fan in trunk in roof, except those rooms which contain fireplaces; opening fanlights over each door; large fitted wardrobe to each room, in some cases with mirror panel in door; marble slab in angle for wash basin; linoleum floor covering, and skirtings and border, with well-rounded angle, in cement; reversible sash windows with extra deep bottom rail to allow ventilation at meeting rail without bottom draught. The walls are distempered, and a picture rod is provided round each room.

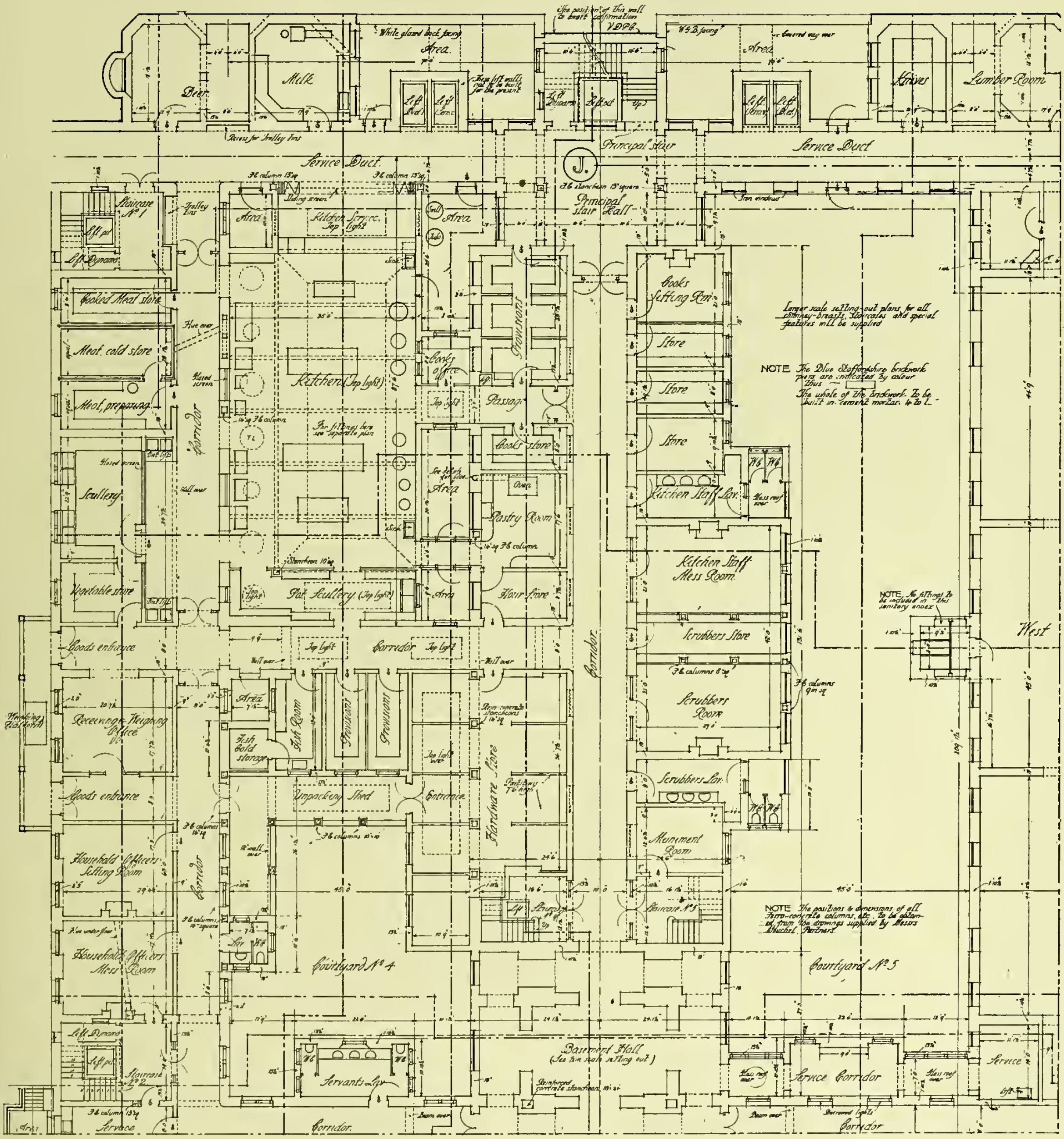
Ample bathroom and lavatory accommodation is provided, fitted in the best manner, with large white enamel cast-iron baths supplied by separate hot-water cylinders, providing 15 gallons of hot water at one time, an arrangement to prevent waste of hot water. The discharges from these baths and lavatories are in all respects similar to those in the Hospital proper (see Engineering Section). There are hair-washing rooms, together with boot-cleaning rooms; and housemaids' and draw-off closets are provided on each bedroom floor.

NIGHT NURSES' CORRIDOR.

The corridors are well lit by occasional open lobbies to external walls, providing fresh air and light. Sufficient air is warmed by radiators in the corridors to allow of transmission of same to the bedrooms through the fanlights over the doors, the air being extracted by means of gratings near the floor level. Everything possible has been done throughout to prevent lodgment of dust and dirt, and to facilitate easy cleaning and ensure sanitary conditions.

	Bed.	Bath.	W.C.'s.	Boots.	Hair.
PRESENT.					
1st Floor	12	2	3	1	-
Ent. ,, ...	23	4	3	1	-
2nd ,, .. .	51	8	7	2	2
3rd ,, ...	51	8	7	2	2
4th ,, ...	51	8	7	2	2
Present Total ..	188	30	27	8	6

	Bed.	Bath.	W.C.'s.	Boots.	Hair.
FUTURE.					
1st Floor	23	4	3	1	-
Ent. ,, .. .	23	4	3	1	-
2nd ,, .. .	23	4	3	1	-
3rd ,, ...	23	4	3	1	-
4th ,, ...	23	4	3	1	-
Future Addition ..	115	20	15	5	-
Complete Total ..	303	50	42	13	6



Larger scale setting out plans for all chimney-breasts, staircases and special features will be supplied

NOTE The Blue Staffordshire brickwork piers are indicated by colour thus — The whole of the brickwork to be built in cement mortar 4 to 1.

NOTE No fittings to be included in this sanitary annex

NOTE The positions & dimensions of all ferro-concrete columns, etc. to be obtained from the drawings supplied by Messrs Mouchel Partners

KITCHEN AND STORES DEPARTMENTS.

The number of nurses' bedrooms provided at present is 188. Upon the completion of the west block, in the future, this number will be increased to 303. The table on p. 8 shows their disposition on the various floors and the number of bath-rooms, etc., provided.

KITCHEN.

The kitchen is on the basement floor level, and is between the east and central blocks of the administration buildings, thus being centrally placed for service to the entire Hospital. It has a fine reinforced concrete monolithic roof of an unique character, without trusses, carried out, as has been all similar work, by Messrs. Mouchel and Partners, Ltd. Diet lifts, numbering four, convey the food through a short duct to the various levels of the main corridor, whence it will be wheeled on trolleys to the several wards.

The detailed block plan on the preceding page gives an opportunity of examination of the various points of interest, of far greater value than a description in words.

In order to provide for easy passage of the dinner waggons into the kitchen, the doors are of exceptional width and slide on runners. The kitchen is floored with Ruabon tiles. The cooking is partly by steam and partly gas, a full description of which appears under the Engineering section.

Alongside the kitchen are situated the larders. Adjacent to the kitchen is a room for the storage and washing of dinner trolleys.

The pastry room is situated in a room specially provided for the purpose, having a marble rolling slab.

The scullery is fitted with galvanised iron washing-up sinks with teak tops and draining boards, and Lintern's plate racks.

There is storage accommodation as follows :—

Vegetable store. This is fitted with compartments for each kind of vegetable, having movable fronts, after the fashion of a coal cellar.

Steward's office.

Fish larder.

The hardware store is on the same level with the kitchen, and attached to it is a covered portion of the yard where goods are unpacked.

There is a room for the storage of the charwomen's utensils, such as scrubbers, brushes, pails, etc., with separate compartments, also a room for the charwomen's meals.

The charwomen leave by a main corridor which passes the steward's office.

There is a room for the storage, in rolls as supplied, of haberdashery, such as muslin and calico, which are given out by the sister housekeeper.

The window frames of the store rooms are in many cases made with metal instead of wood in order to avoid reducing the light.

THE HARDWARE STORE.

STORES.

System of Receipt and Distribution.

The block plan already referred to affords also an illustration of the entrances for goods for both the kitchen departments and general supplies, and the ease of distribution is made evident by an examination of the relative positions of the various store rooms and of the Kitchen, Dispensary, Dining-rooms and Ward Blocks.

Linen Department.

This important department, with all its accessories, has been placed beneath the Chapel, that being a central position and in connection with all parts of the Hospital. It is adjacent to the main corridors.

POWER HOUSE.

Access to the power station is gained through basement corridors in the two central ward blocks (see plan). Here steam heating for the whole building is generated and also the electric power. A destructor and departments for refrigerating and cold storage are here situated. Electrical clocks and an automatic telephone system have been installed.

OUT-PATIENT (AND CASUALTY) DEPARTMENT.

General Disposition.

The Casualty and Out-patient Departments are in separate blocks at the lower corner of the site nearest the main road, as mentioned. These departments have been placed in juxtaposition on either side of an entrance court 40 feet wide, the portion embracing the entrances being covered by an iron and glass roof. At the head of this court is the general entrance to the Hospital receiving-rooms and baths, on the left; and to the Bathing Establishment on the right; access to either of these sections can be gained from the Out-patient Department, should patients be ordered there forthwith.

Separate access to the Hospital from the Casualty Department is also provided through a warmed corridor.

Entrance for old patients to the Bathing Establishment and the Electrical Departments is effected without passing in at the general Out-patients' Department, as hereafter described.

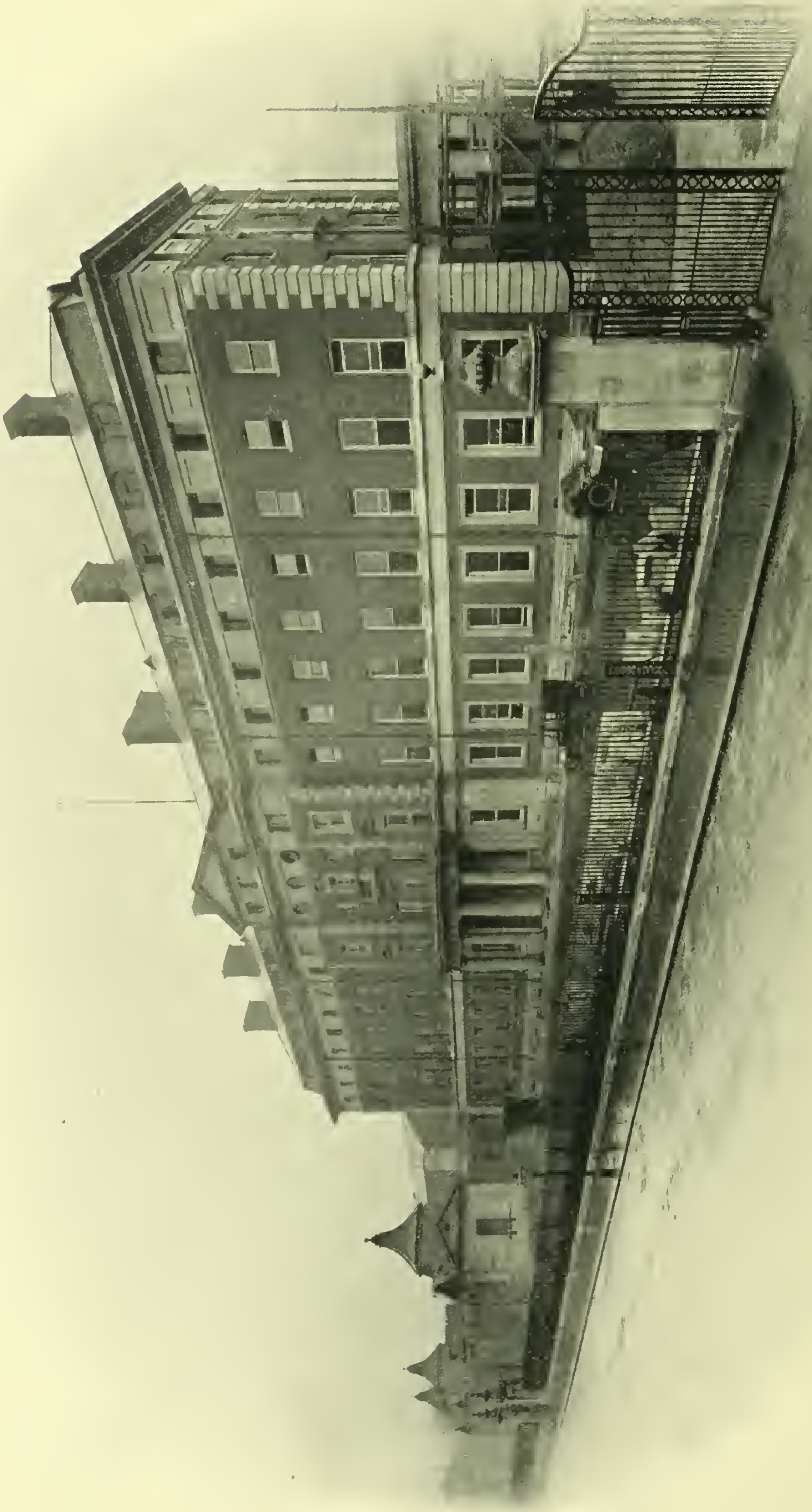
THE CASUALTY DEPARTMENT.

This provides for the immediate treatment of major and minor casualties, both surgical and medical. The examining rooms are disposed on each side of a waiting hall. A separate entrance, leading to the surgery, is provided for the admission of serious accidents. On the first floor a small observation ward, complete with ward-kitchen, etc., is provided for the reception of urgent cases which are desired to be kept under observation prior to being admitted to the wards proper. This ward contains eight beds, each in a separate glass-screened cubicle.

CONSULTING ROOM.

Directly opposite the entrance a glazed office is seen, where enquiries are answered and directions and tickets issued. To the left and right are sanitary conveniences, within open yards. Behind the office, and under immediate control, is the waiting hall, from opposite sides of which open the consulting rooms, containing five cubicles in each. A separate entrance immediately opening to the surgical side is provided for urgent and unsightly cases. Isolation rooms with separate external exits, and a padded room, together with the necessary administrative rooms, are provided.

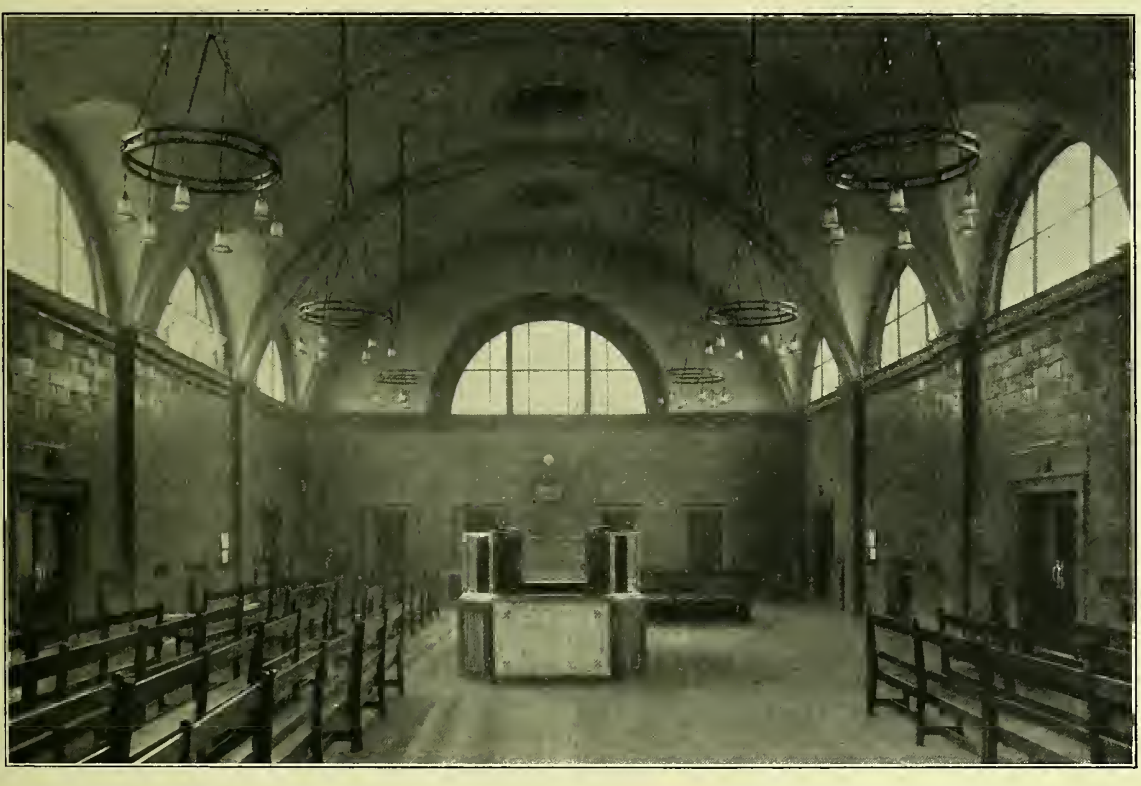
Under the slope forming the entrance to this



VIEW SHOWING OUTPATIENT (AND CASUALTY) DEPARTMENT, ON LEFT.

department is provided a chamber for perambulators to be left in safety while patients are receiving attention.

The observation rooms are arranged on the upper floor, a bed-lift for service thereto being placed in the well of the staircase. The ward has been planned on the cellular principle, with glass screens and ventilation on similar principles to those described later in connection with the Isolation Block. The usual sanitary conveniences are provided, and the necessary nursing arrangements sufficient to make the department complete and self-contained.



OUT-PATIENTS' WAITING HALL.

THE OUT-PATIENTS' DEPARTMENT.

The Out-patients' Department is entered through registering offices situated on two sides of the vestibule to the large waiting hall (93 feet by 42 feet), with a buffet in centre. There are corridors on each side of this hall, from which access is gained on the north side to surgical consulting rooms, with operating theatre, and the Ophthalmic Department, with operating theatre; and on the south side to the Children's Department, medical consulting rooms, and Throat and Ear Department, the whole so arranged that patients, having seen the doctor, do not retrace their steps to the waiting hall. Above these rooms, on the south side, is the Dental Department, with excellent north light. Beyond the waiting hall and on the ground floor is the Gynæcological Department. From these side corridors access is gained through a third corridor to the dispensary waiting hall, out of which leads the Almoner's Department, where the status of patients is investigated. The dispensary, behind which are dispensers' apartments and a teaching laboratory, with various manufacturing departments and stores in the basement, is connected with the main hospital corridor.

Dispensary Waiting Hall.

The patients having been seen by the medical officers in their respective sections, proceed along the several exit corridors and concentrate in the waiting hall attached to the dispensary. This is provided with further lavatory accommodation. Having received their medicines, the patients pass out by an open, enclosed passage-way direct to Bessemer Road.

The dispensary will be found described under "Dispensary Block."

Children's Section.

The Children's Department is placed nearest the entrance on the south side. There is a waiting-room with a fireplace decorated with tiles depicting nursery rhymes. The children having been undressed while awaiting examination by the doctor have thus the advantage of a fire. There are two undressing boxes, a weighing cabinet and special lavatories. The Physician's and Assistant Physician's rooms adjoin, and have a small dark room attached. There is a separate department for cases of whooping cough, with its own waiting-room; and close at hand an isolation room has been provided. Both the waiting-room and the isolation room are provided with outer doors for the immediate discharge of an infectious patient; the isolation room being intended for the reception of an infectious case pending removal by ambulance, thus obviating any retracing of steps to the general Out-patients' Department.

Women and Gynæcological Section.

The accommodation for these cases is at the further end of the large hall. Patients are first seen by the Assistant Physician. Attached to the room of the Physician is a large examining room, in three bays, with six undressing boxes, so that one patient may be seen while others are being prepared. The boxes are approached by an independent passage which also serves as an exit. Adjoining the entrance to this department is a small pessary room.

OPERATION THEATRE, OUT-PATIENTS' DEPARTMENT.

Medical Section.

Adjoining the Women's Section is placed the Medical Section. Entrance and exit are provided for procession; the Clinical assistant performs his duties in the one room (200 feet super), off which opens the teaching room (400 feet super), which communicates with the consulting room (300 feet super), all these having separate and distinct exits. The five small rooms are disposed in the remaining space, the two larger of which are lighted from the side, the remainder from the top; they are of cubicle character. The exit is made to the corridor leading to the Dispensary Department.

SURGICAL SECTION.

At the north-east end is the surgical section, which is entered from the hall to a slip room containing four dressing boxes. Adjacent is the clinical assistant's room (300 feet super), which in turn also opens to the teaching room (600 feet super) and to the dressing room (400 feet super), which serves both, the cubicles being divided in proportion.

These rooms have been so arranged that although they inter-communicate, yet they each have a separate entrance and exit, and can be used for treatment, as considered apart from teaching. A separate entrance has been provided to the 600 feet super room. All of these rooms and adjuncts have direct lighting, both at side and top. Adjacent, has been provided the operation room, which has no entrance directing from the waiting hall. Here is provided a slip room for waiting, preparation room for patients, anæsthetic, and recovery rooms. This department of the section is fully lighted on three sides and top.

THROAT, NOSE AND EAR SECTION.

The windows are glazed with deep orange glass, artificial light being used exclusively. The sides of the consulting rooms are divided into twelve stalls for the examination of patients, having partitions on which are black Durato squares to serve as blackboards.

In the pathological and teaching room there is a large Durato blackboard; a line is formed in Durato of a distinctive colour, with a scale in feet and metres, in the floor.

In the theatre a similar arrangement exists as regards the glazing of the windows, with a flex wood blind attached, usable to exclude daylight completely, or, on being set at an angle, as a sunblind.

The recovery room is fitted with six basins, the waste pipes of which discharge into a long open channel in the floor.

The refreshment buffet in the centre of the waiting hall has many interesting features, being quite an ornament to the hall. The outer sides of the walls of the buffet are formed in Rust's vitreous mosaic, with a glazed screen round the counter.

The floor is of asphalt. The walls of the hall are lined with terra cotta to a height of about 15 feet. The windows above are semi-circular in shape.

OPHTHALMIC DEPARTMENT.

This adjoins the Surgical Section and is on the north side, the window sills being above that level. The arrangement of the department enables a large number of patients to be quickly treated without retracing steps.

DENTAL SECTION.

Returning to the office at the entrance, it will be seen that the corridor opposite the same leads to a staircase giving access to the Dental Department, which is placed upon the upper floors on the south side. At the head of the staircase has been provided the waiting-room, and from a corridor open the several rooms required in this department. There is no retracing of steps; a staircase at the far end gives access to the exit corridor at the Dispensary termination.

BATHING ESTABLISHMENT.

The Bathing Establishment is common to the Out-patient Department, the Casualty Department, and to the Hospital proper, and it will be seen from the arrangement on the plans, that it is placed in convenient proximity to all. It also has its own separate entrance shared in common with the receiving-rooms of the Hospital. It has been considered as part of the Out-patient Department.

The working will be on alternate days for the sexes. The department is under the direct control of the office, in the same manner as the Dental Department.

Entered on the right have been located small but complete vapour baths, the situation being governed by circumstances of planning and space.

Beyond this have been placed the douche, spray and needle baths. The other simple baths provided are alkaline, bran, size, cold, and warm. Among the medicinal baths provision is contemplated for mercurial fumigation of arm and leg. Itch treatment: lime and sulphur (in the latter the ceilings being specially painted to avoid the natural effect of discoloration, and no fittings of brass being used). Lavatory accommodation has been provided here also. At the far end of the department a corridor gives access to the staircase to the main corridor above common to the whole of the Hospital wards.

On the first floor is the Electrical, X-ray, and Massage Department.

DISPENSARY.

Dispensary Block.

The Dispensary lies between the smaller waiting hall of the Out-patient Department and the Hospital, and is fitted up with the necessary equipment for working both the latter department and the whole of the Hospital proper. It is provided with direct lift communication to the drug and surgical stores above and below, and the medicine lift in the main corridor conveys the dispensary trolleys to all floors of the Hospital.

On the Hospital side of the Dispensary a hatch has been provided, together with the dispensers' office and quarters. A staircase also communicates with the drug stores, etc., below, and the soda water manufactory; there is access for carts for the reception of goods in bulk from the main entrance by the sloping roadway for the general reception of stores, etc.

Electrical Section.

The Electrical Department (with the Bathing Establishment) being common to the use of the Out-patient Department and the Hospital proper, has been arranged with similar means of access to those employed for the Bathing Establishment and the Dental Section already described. It has been considered from the standpoint of the Out-patient Department, and is entered, as that department is, by the main entrance to this block, and is directly under the control of the clerk's office.

WARD AND THEATRE BLOCKS.

From the main corridor on the south project the Ward Blocks, of which six out of the nine provided for in the complete scheme are built. The two central ones are named, respectively, The King Edward VII. and The King George V. Ward Blocks, and are three storeys in height.

Between these is the Chapel, with linen department under, and beyond this the power station. The Administration Block is on the opposite side of the main corridor, and fronts on to Bessemer Road. Owing, as already remarked, to the conformation of the site, the

A WARD.

lowest wards are on the first-floor level of the Administration Block.

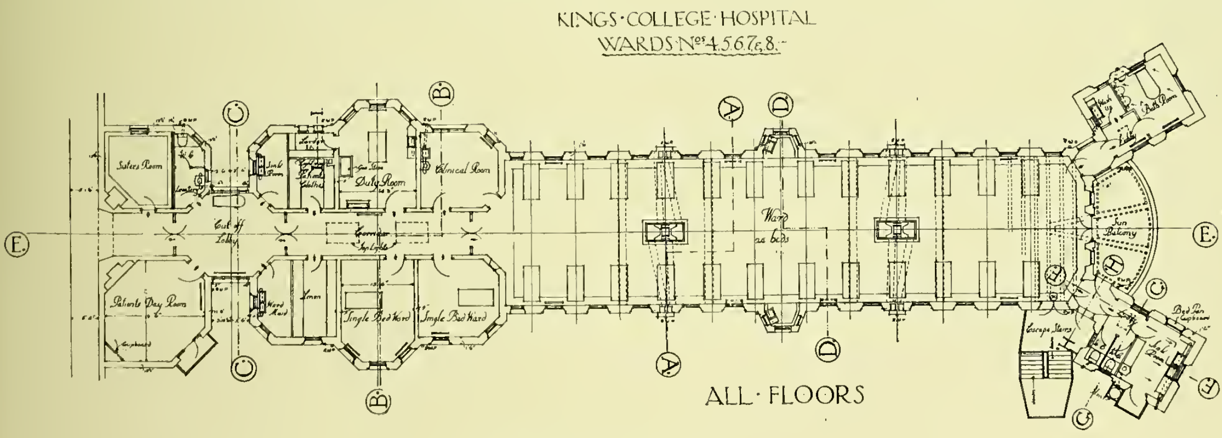
It will be seen that the whole of the seven blocks of large ward units enjoy the best aspect, having an axis of north to south, and the maximum of sunshine.

The space between each ward block provides a good access of light over the adjoining block. The intervening spaces between the wards will be utilised as grass, lawn tennis courts, and flower gardens.

An air space is provided beneath all the wards, and where the several blocks adjoin the main corridors.

Fire-escape stairs are provided to all the wards direct to the ground level.

The general ward blocks already erected, as indicated by the block plan, are five in number, two being of three storeys and three being of two storeys. The wards each contain twenty-four beds. Between the wards proper and the central corridor are day rooms, ward kitchens, ward-sisters' rooms, etc. At the end of the main corridor, and running north and south,

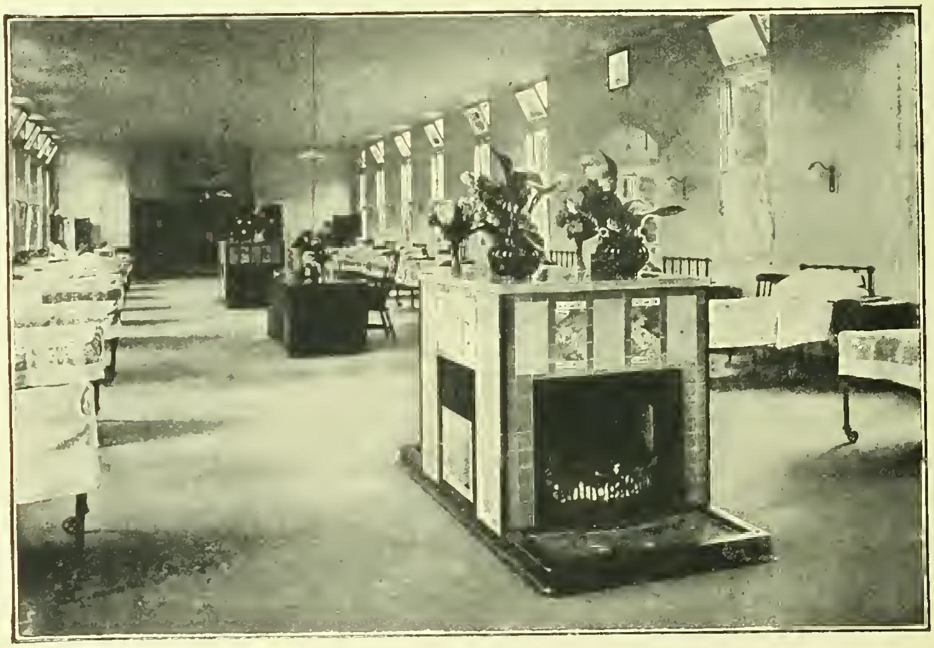


GENERAL WARD BLOCK.

is a two-storey special ward block, containing four wards of fourteen beds each. These wards are for ophthalmic cases and for diseases of the ear, throat, and skin.

The wards, as will be seen, are dissociated from the main corridors; an ample circulation of air is assured in addition to the cut-off between the smaller ward annexes and the great ward.

The wards are severally 27 feet wide; the floors are of the Mouchel-Hennebique system of ferro-concrete construction; the ceilings are flush through, the girders being concealed between floor and ceiling; all angles in floors, angles of walls, vertical and horizontal, and angles of ceilings and girders are curved to a radius of 2½ inches. The walls are rendered in Portland cement and finished with granite silicon plaster brought to a smooth face, wooden plugs being inserted where it is desired, to place wall hooks for notices, etc.



CHILDREN'S WARD (SHOWING TEALE STOVES WITH TILES DEPICTING NURSERY RHYMES).

A window is provided on either side of each bed. These windows are of the Austral pattern, which allows of the frames being put in such a position that the air may enter half-way up the window space but without any side draught. The frames (top and bottom) can be entirely reversed to allow of cleaning from the inside. The remaining portion is a hopper-hung fanlight, obscured to reduce sunrays, opening inwards, with glazed cheeks. The blind, on patent hooks, is hung on the lower side of fanlight. These windows extend from 3 feet 3 inches above the floor level to within a few inches of the ceiling, in order to secure adequate admission of air and sunlight.

An area of about 1 foot superficial of glass has been used to 70 feet cubic of space.

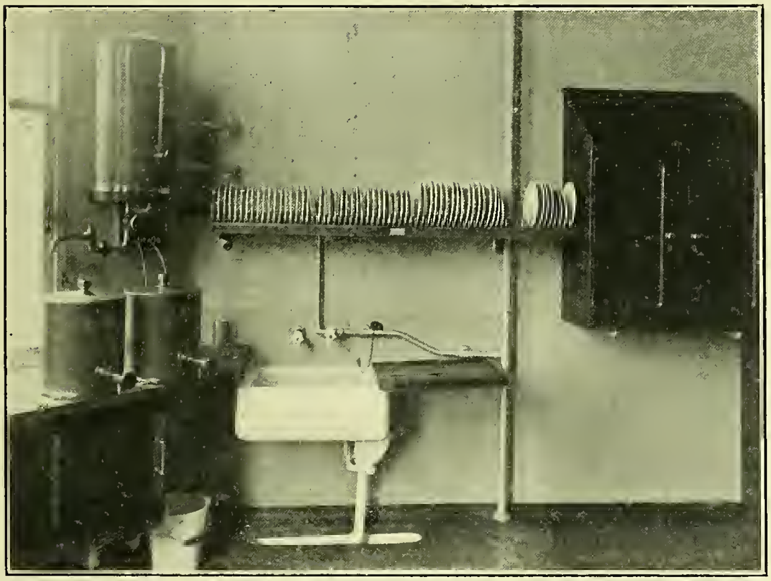
The plastering of the wall is carried in to the window jambs, the external angles being rounded as described and tucked into the groove in window-boxing.

The warming is by radiant heat, supplemented by low-pressure steam radiators. The fireplace central Teale stoves, tiled, are dual, with descending flues fed by fresh air and distributed over the ward; four fires are provided to each large ward unit; the ventilation being further augmented by inlets and outlets over each bed, with hit-and-miss regulators, those below being round in section, bent in form and square on face, 6 inches by 6 inches, the hit-and-miss being operated by a turn buckle; the gratings are hinged in order to afford easy cleansing.

At the points of the ward where radiators are provided, inlets are placed behind the same about 12 inches by 9 inches, with hit-and-miss gratings worked by rods, a plate being arranged in the radiator to give the incoming air impinging on the plate an upward motion (Slater's patent).

The inlet through the wall to the radiators is in the form of a bend, in three straight lengths, the plate on the external face being hinged.

At the far ends of the wards, the large sun balconies have splayed sides to trap the sunshine, the floors over are supported by light iron construction, so as to insure as little obstruction as possible. Room is provided that beds may be wheeled out.



WARD KITCHEN.

Sanitary Towers.

On either side of the balcony are the Sanitary Towers; these are parted from the ward unit by cross ventilated lobbies low in height, with an intervening air space above and below.

The windows and doors to these are provided with Moore's glass louvres in metal frames, so that the whole or part space can be opened and closed at discretion. Doors, to which the customary panic bolts of the pattern prescribed by the London County Council are fitted, give access from each floor to the fire-escape stairs.

The water closets (Corbel pattern apparatus) and sink room are in one tower. The lower rail of the doors are 9 inches clear of the floor, the same applying to the partitions.

The most approved bed-pan sinks are provided, with means for warming the vessels before use, proper racks being provided for them.

Sinks and draining-boards—Mackintosh sink shelves—are fixed away from the walls. A bed-pan cupboard, with external ventilation, is provided. The ventilation of both the water closets and bath annexes is in the same manner as provided for the wards, the walls being built of glazed brick. The sink room is so arranged that patients do not pass through it.

In the bath and lavatory annexe, the bath is in the centre of the space. The accommodation admits of the bath rooms being used for dressing purposes.

In the Lavatory Section are the arrangements for disposal of soiled ward linen. To each lavatory on the three floors of the large ward unit and the two floors of the smaller units, galvanised bins are placed on a balcony. Access outside by the porter to the same is by means of the fire-escape stairs. At the centre on each side of the wards is a small lavatory bay for the use of the Staff, one having a shelf for lotion bowls, lotions, and instrument steriliser.

In the Children's Ward the tiling of the central fireplaces is ornamented with Doulton tiles depicting old nursery rhymes.

For convenience in bathing patients unable to go to the bath-rooms there is a portable bath provided, which stands, when not in use, in the cut-off lobby between the corridor and the ward, being filled from a mixing valve with cold, tepid, or hot water, as required. An open gulley is provided for the discharge of the bath for emptying. The valve is of metal, porcelain-enamelled, similarly to the taps throughout the building generally.

The ward tables have marble tops with lockers and drawers at the sides.

OPERATION THEATRES.

Between the Pathological Block and the north wing of the Special Ward Block are two operation theatre blocks, of two storeys each. The sinks, basins, slabs, etc., together with the sterilisers, have been placed in a bay, where also can be provided the arrangements for the electric cautery, etc.

The anæsthetising room is situated on one side of this bay, the surgeon's room upon the other, each with its separate entry.

Adjoining the operation room has been placed the sterilising room, fitted with an installation of steam to the sterilisers.

On the opposite side, the students and spectators enter. Space has been provided for about eighteen. Spectators do not come on to the actual floor of the theatre.

The operation theatres are floored with Terrazzo, the same material being used for the seats in the spectators' gallery. The heating is on the panel system, a 1-inch pipe being run on the face of the brickwork in convolutions, and in convenient lengths to cover the whole surface of the walls, but generally of about 5 feet in length, the distance between the parallel portions being about 6 inches. The walls and ceilings, on both of which this arrangement is carried out, have then been covered with Durato, which will eventually be enamelled. The ventilation of the operation rooms is by inlets at the floor level, and extraction by means of electric fans.

PART OF THE MAIN CORRIDOR, 900 FT. IN LENGTH.

OPHTHALMIC THEATRE.

In the Ophthalmic Theatre provision has been made to allow of the couch on which the patient lies being wheeled into a recess built out beyond the line of the window, so as to bring the head of the patient close to the light. In this theatre, and also in the theatre attached to the Throat and Ear Department, are provided flexwood blinds to exclude the daylight when necessary.

CORRIDORS.

The width of corridors (see page 20) is 10 feet; the main corridor is nearly 900 feet in length (about the length of the ill-fated *Titanic*).

A "blow-through" is provided between all the ward blocks with the object of preventing stagnation of air, the height of the corridor being reduced compared with the ward blocks, allowing openings between the roof of the corridor and the floor above.

ISOLATION BLOCK.

In the north-west corner of the site is the Isolation Block for infectious diseases, which provides for the accommodation of eight patients, and is arranged for future extension.

This block, although planned upon the same principle as the Hôpital l'Institut Pasteur, Paris, represents a notable advance on the existing French provision. Direct cross ventilation is secured by keeping the nursing corridor at a lower level than the wards, the space above being open, to provide a "blow-through" as in the case of the general wards, and on the upper floors the ceiling of the corridors becomes a flat with no intervening space.

Friends can visit the patients by an outside access and see them from the verandahs which are also available for nursing and for the removal of evacuations.

The duty room and sick room are centrally placed, and here the nickel plates, cups, etc., are sterilised after use. The patient is bathed in his cell, and the dirty linen is put into a cylindrical box and removed for disinfection.

THE MEDICAL SCHOOL.

The Medical School is connected with the Pathological Block, and fronts on to Bessemer Road, balancing the Out-patients' Department on the other side of the Administrative Block. The Medical School, when complete, will contain a spacious lecture theatre, library, and museum, together with laboratories for practical research work.

PATHOLOGICAL AND *POST-MORTEM* DEPARTMENT.

On the same side of the corridor as the Administration Block is the Pathological and *Post-mortem* Department. There is a small Mortuary Chapel in this block.

THE CHAPEL.

The Chapel (see next page), placed on the central axis of the buildings, is entered through a narthex behind the main staircase. It has seating accommodation for 250; the roof is supported on ferro-concrete piers, and the keynote of the decorative scheme is simplicity. The organ, pulpit, and many of the benches have been removed from the old Hospital. The vestries are reached by a staircase, and are on a level with the Linen Department.

Entered from the chancel is a small sacristy. The six stained glass windows came from the old Chapel. The windows have a surround of mosaic bands. A very broad central aisle is left in order to provide room for couches and wheeled chairs. Two doors lead to the narthex from the main corridor, and in the narthex there is a niche also lined with mosaic with a painting (removed from the old Hospital) by a Spanish master, descriptive of Christ's descent from the cross, which is inscribed, "Juan Baptista Juanes. Born 1523. Died 1579." The chancel rails are of white metal.

The Chaplain's quarters are situated in the centre of the Administration Block, exactly opposite the Chapel.

FLOORINGS, STAIRCASES, ETC.

Floorings.

The floors of the in-patient portion of the Hospital, with the exception of those of the main corridors, which are of asphalt, and of the wards, which, with one exception, are covered with linoleum, are Durato. Terrazzo is used in the sanitary compartments.

In addition to the ward floors, those of the bedrooms and corridors and the Nurses' Home are covered with linoleum, laid, in all cases, on concrete. The rooms of domestic character (or living rooms) are laid similarly with linoleum.

The consulting rooms in the Out-patient and Casualty Departments and nearly all the annexed rooms have Durato floors. The out-

THE CHAPEL.

patient waiting hall is floored with asphalt. The Chapel and Board Room, together with certain of the main sitting-rooms, etc., have wood block floors, polished with Ronuk.

Finish of Walls.

The walls, except those of the operation rooms, etc., specially referred to, are faced with granite silicon plaster enamelled ivory-white with "Paripan."

Fireplaces.

The fireplaces are mostly Teale, and the whole of the mantelpieces have been specially designed.

Doors.

All the architraves of doors are formed in plaster wrought on iron frames and rounded. All door furnishings are of aluminium alloy, which will oxidise, but requires no polishing.

Each door lock in the Nurses' Home and other domestic quarters is fitted with two keyholes of which one is the master, so that if a door is locked on the inside and the key left in the lock, the door can be opened from the outside with a master key.

Gilmour Hospital doors have been used generally in connection with the wards, Out-patient, Casualty and other special departments. A glazed port-hole is made in the centre of the doors at a convenient height for the purpose of observation in connection with the lavatory blocks, etc.

STAIRCASES.

In some parts of the building the steps and the dado of staircases are of Terrazzo, with solid balustrades of the same.

The balustrades of other staircases are formed in Bickley's "Black and White" composition, in the same manner as the dado of the staircase walls, having a fine red polished surface.

TELEPHONES AND CLOCKS.

The inter-communication system of internal telephones and of synchronised clocks has been installed by Siemens.

WINDOWS.

The windows of the wards are of the Austral pattern already mentioned, the others being chiefly fitted with Rhodes patent sash hangers and reversible fittings.

RADIATORS.

The steam pipes to the radiators are kept outside the wards by being run in chases in the reveals of the windows, the chases being covered with removable cement covers.

The radiators, which are finished in bronze paint, are made to swing out from the walls in accordance with the modern principle, and are on the low-pressure steam system.

FITTINGS OF CLINICAL ROOMS.

Poison cupboards in polished teak are situated in the clinical room attached to each of the wards, and are specially made with very convenient racks and other means for storing, with a pull-out ledge at the bottom. Under the solution jars are fixed troughs to catch the drippings, the troughs being removable for emptying and cleansing.

FITTINGS OF BATH ROOMS.

All taps are porcelain enamelled. There are specially designed waste pipes with hopper heads, which are removable for cleansing. The principal thing is that there is an absence of brass to be cleaned, and an absence of weir to get dirty. There are rubber plugs in the water basins and baths, and no brass rings.

CONTRACTORS.

The contractors for the building are Messrs. Foster and Dicksee, of Rugby.

SUB-CONTRACTORS TO MESSRS. FOSTER AND DICKSEE.

ASPHALTE :
Limmer Asphalte Co.

BLINDS :
Flexwood Blind Co.

BRICKS :
London Brick Co.
Geo. Lawrence & Sons.

CASEMENTS :
Crittall Manufacturing Co.
Thos. Elsley, Ltd.

CEILING LIGHTS :
British Luxfer Prism Syndicate, Ltd.

DISTEMPER :
Silicate Paint Co. (Duresco).

DOOR FRAMES :
Crittall Manufacturing Co., Ltd.

DOORS :
Gilmour Door Co.

DOOR FITTINGS :
James Gibbons.

FERRO-CONCRETE :
F. Bradford & Co.

GLAZED BRICKS :
Farnley Iron Co.

GLAZING :
London Sand Blast and Glazing Co.

LOCKS :
Burt and Potts, Ltd.

PAINT :
Randall Bros. (Paripan).
Indestructible Paint Co. (non-corrosive).

PARTITIONS :
D. and C. Rutter & Co.

PLASTER :
James Bickley.
Granite Silicon Plaster Co.

PLASTIC FLOORINGS :
Durato Asbestos Flooring Co., Ltd.

TERRAZZO FLOORINGS :
Diespeker, Ltd.
Rusts Vitreous Mosaic Co.

WINDOW SASH HANGERS AND REVERSIBLE SASHES :
Rhodes Patent Sash Hanging Co.
Austral Window Balance Co., Ltd.

ENGINEERING DESCRIPTION.

Before describing the engineering equipment of the Hospital, a short statement of the conditions imposed by the site and probable demands for light, power and heating, and hot water may help towards a proper understanding of the problem presented and the way in which it has been solved by the consulting engineers, Messrs. Kirkland and Capper.

The site is a difficult one in view of the difference of levels, and this fact has governed the design of the heating and hot water services, and rendered necessary a variation in the treatment for certain portions of the building. As a primary condition for economical working, the whole plant has been designed so that all condensed steam shall be returned direct to the boilers, the only exception being in such positions as the kitchen, where the contaminated discharge from vegetable steamers, etc., passes to the drains.

Apart from the lighting plant therefore, the make-up feed to the boilers is small, and only if steam were used for the electric generating sets would this feed be considerable, at times when the heating was not required so that the exhaust steam could not be utilised.

After careful consideration, from all points of view, of a proposal to obtain steam and electricity from an outside source, the Committee of the Hospital came to the conclusion that the advantages of their own generating plant outweighed those of the alternative proposal, and that they would not be justified in accepting the latter, and the consulting engineers were instructed to prepare designs for a complete installation. A number of alternative schemes were prepared, and, after investigation of their relative merits, it was decided to instal Diesel oil engines for driving the electric generators, and Lancashire boilers, working at 80 lbs. pressure, for the heating and hot water services. One of the factors which determined this combination was the fact that, if a well should have to be sunk to provide water to the Hospital, in the event of the water rates becoming excessive, the hardness of the well water would be detrimental to the boilers if the larger quantity of make-up feed required for steam engines were used without previous softening. By careful examination of estimates of working cost, it was found that the probable working costs of the combined oil engines and boiler plant would be less than that for steam-driven dynamos.

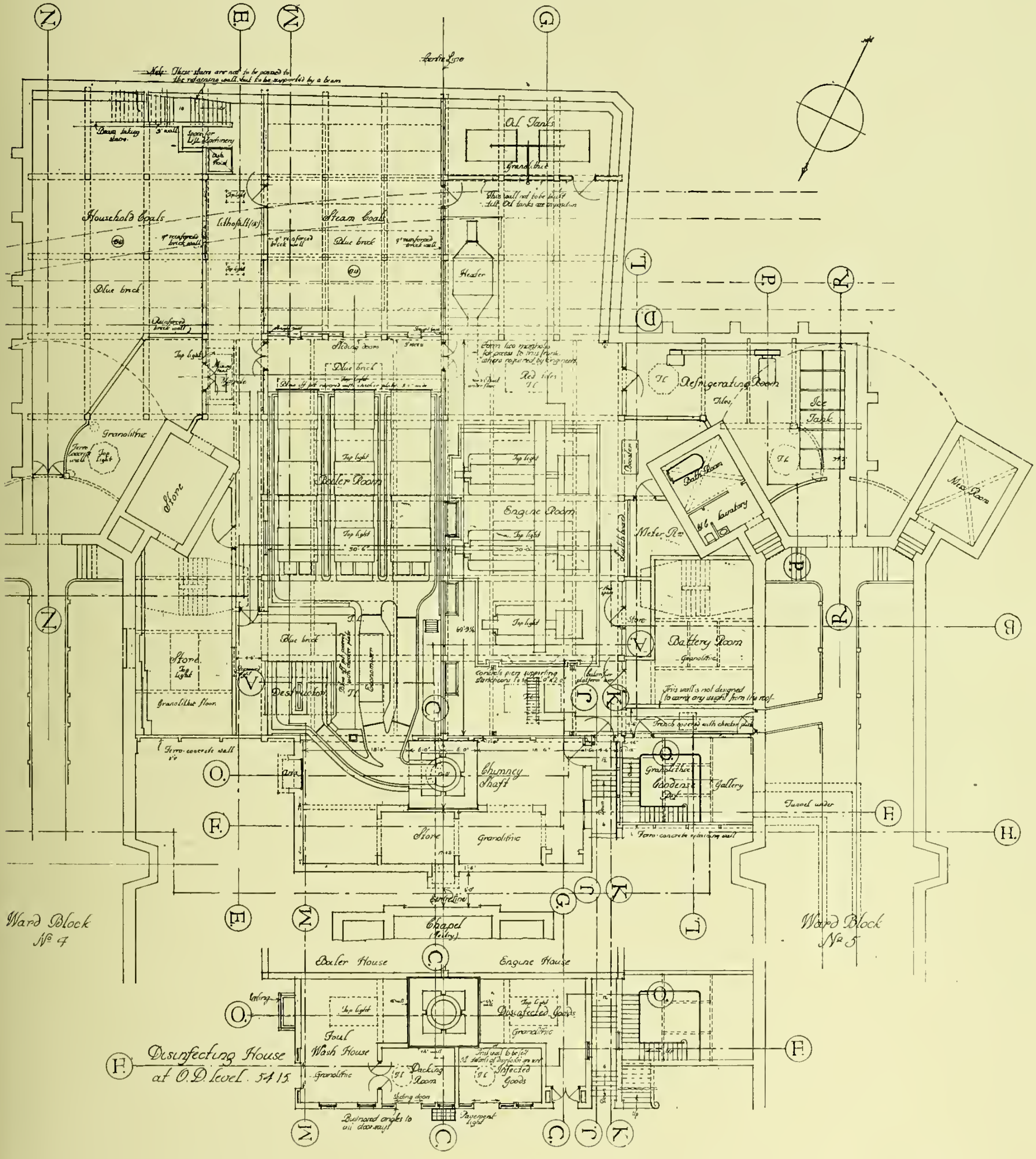
For similar reasons, electrically-driven rather than steam-driven plant has been installed for the auxiliary machinery, as with steam-driven plant the lubricating oil would have necessitated undue complication if the exhaust was to be safely returned to the boilers.

For heating it was decided to employ a low-pressure steam-heating system by radiators, the return being connected through a condenser and vacuum pumps to the main feed tank, so that sub-atmospheric heating could be employed, and the range of temperatures obtainable varied at will within considerable limits.

For the steriliser and dispensary, as well as for the vapour baths, kitchen, and other services requiring high-pressure steam, a special heating main is provided, so as to give any required pressure up to 30 lbs. per square inch.

Hot water is supplied by calorifiers placed in the engine room, heated by steam at 50 lbs. pressure, the condensed water being returned to the feed tank. Water is supplied to these calorifiers either from a cold water tank connected to the water company's mains or from the circulating water discharged from the engines when they are working. The heat discharged to the circulating water from the Diesel engines is thus utilised in warming up the supply to the calorifiers for the hot water service, instead of being, as is normally the case, run to waste. To ensure a positive circulation under all circumstances throughout the extensive area covered by the Hospital, and in view of the considerable variation in levels, an accelerator (Slater's patent) is inserted in the circuit.

From the difficulty of the site levels mentioned above, it was found impossible to place the central station where it was first proposed, at the west end of the Hospital site, which would have provided a more ready access for coal and stores, and would have removed it as far as possible from the wards. It has, therefore, been placed, as shown on the accompanying illustration, about the centre of the south side of the Hospital, and, to avoid architectural objections, while at the same time enabling the condensed water from the heating system to be returned by gravity, it has been partially sunk below the surface, with a roof garden overhead. This position of the generating station has the advantage of centralising the supply in the



CENTRAL POWER STATION.

longitudinal direction of the Hospital, and therefore reduces the losses in distribution. On the other hand, extreme care has been required to prevent any possibility of nuisance from noise or vibration, and many of the special arrangements adopted in designing the plant have been the result of this condition.

DESCRIPTION OF PLANT.

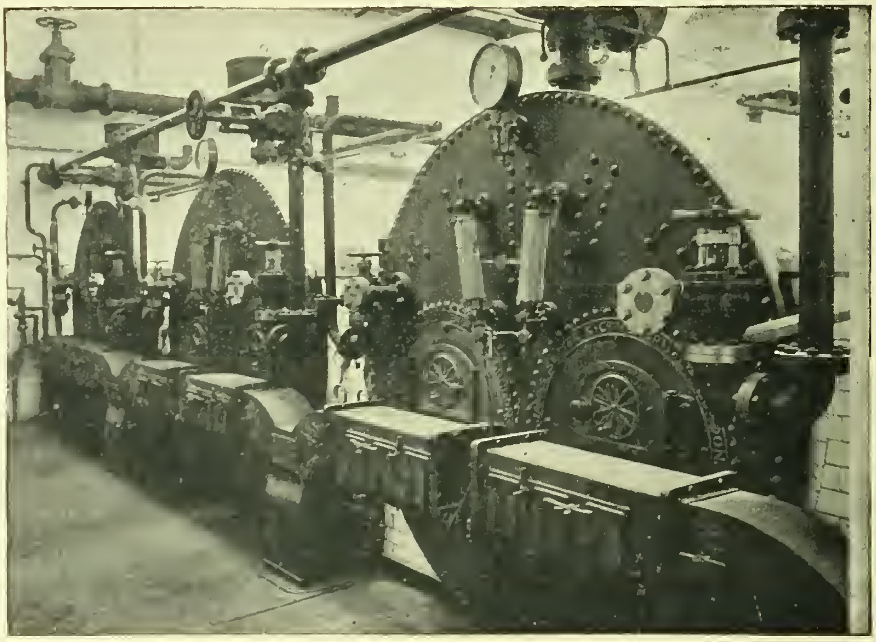
The central station (see page 25) consists of engine room, about 70 feet long by 31 feet wide, and a boiler room, about 70 feet long by 30 feet wide, forming a rectangular block between the two three-storey Ward Blocks Nos. 4 and 5. From the shape of the foundations of these Ward Blocks, the spaces intervening between the station and the wards are of irregular shape, and considerable skill and ingenuity have been expended in utilising these for the various auxiliary services to the engine room. One space has been devoted to a refrigerating plant and ice store for serving the Hospital with ice and cooling the brine which is circulated through pipes to the mortuary chambers, cold meat store, etc.

Other such spaces are occupied by the battery room and telephone exchange and the various store rooms and workshops.

At the north-west corner of the engine house there is a sunk pump and condenser room placed at such a level as to receive the return water from the whole of the Hospital.

BOILER HOUSE.

In the boiler house are placed three Lancashire boilers, supplied by Messrs. James Slater and Co., Engineers, each 30 feet long by 7 feet diameter, fitted with Crosthwaite furnaces, the present working pressure being 50 lbs. The boilers are, however, designed, as stated above, for an ultimate working pressure of 80 lbs. per square inch.



BOILER HOUSE.

At the back of the boiler is a Green's economiser of 120 tubes with electrically-driven scrapers and a destructor furnace for destroying the refuse from the Hospital, the flue from the destructor entering the main flue at the back of the economiser.

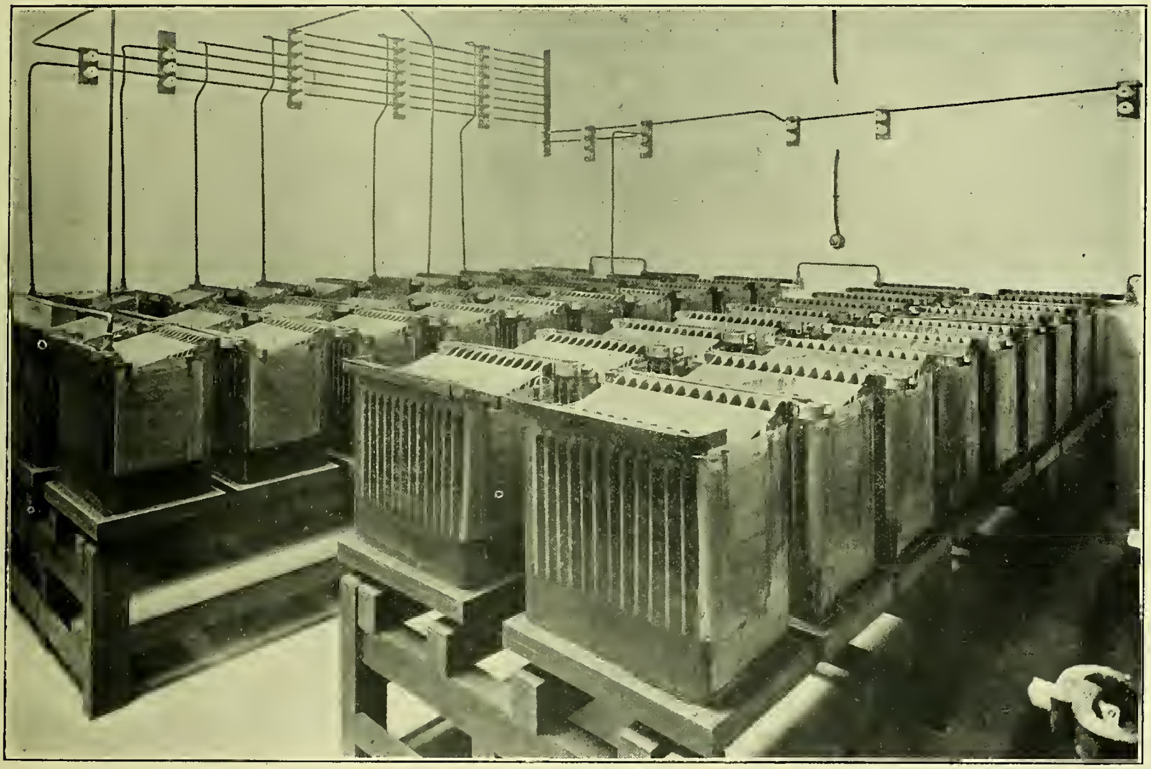
The steam coal bunkers, with a capacity of about 220 tons, are placed to the south side of the stoking floor, and coal is delivered from the roadway above direct on to the stoking level. By the above arrangements handling of the coal is reduced to a minimum.

A weighbridge, made by Messrs. Pooley and

Son, Ltd., is placed in the roadway leading to the central station, so that all coal can be weighed as it arrives.

Air is brought to the Crosthwaite furnaces from an electrically-driven fan driving through a heating chamber heated by the exhaust gases from the Diesel engines. Duplication is provided by a steam blast should forcing be required at any time when the fan is out of use.

Normally the boilers will provide sufficient steam by the use of natural draught alone.



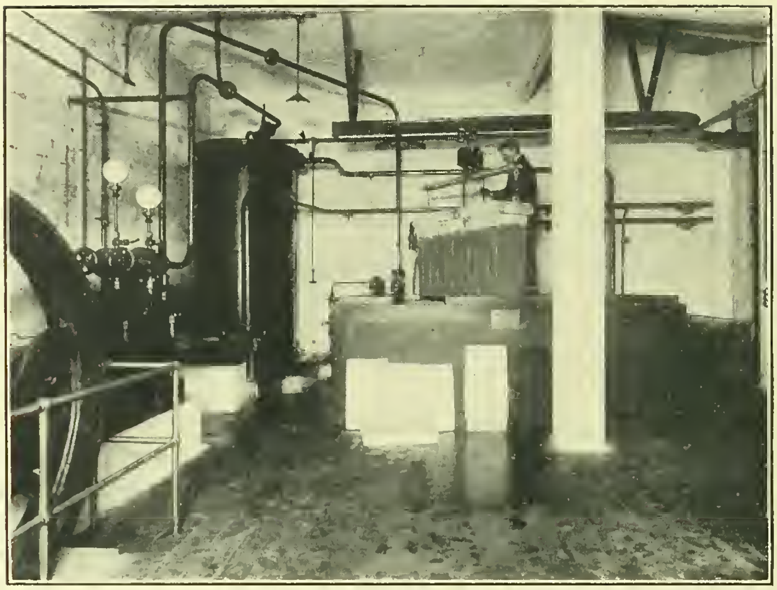
STORAGE BATTERY.

ENGINE ROOM.

In the engine room there are two 100 kilowatt and one 60 kilowatt sets, the Diesel oil engines being manufactured by Messrs. Mirrlees, Bickerton and Day and the dynamos by the Electric Construction Co. The electrical supply is at 100 volts, as being the most suitable for Hospital purposes. The exhaust from the engines passes either direct up the chimneys or, as previously mentioned, through the air heater for the boiler furnaces, valves being provided to direct the gases in either direction. Oil for the engines is supplied from two large cylindrical tanks placed in a storage chamber at the south end of the engine room, and these tanks can be filled direct from the roadway above, ventilation shafts being carried up into the open air through the roof. The oil is pumped from these reservoirs to the auxiliary feed tanks in the engine room by a hand pump. The air and starting vessels, which are of the usual type for Diesel engines, are interconnected, so that any one vessel can be used for starting any engine, thus forming an efficient duplication.

The switchboard, placed on the west wall of the engine room, is divided into seven panels, one for each generator set, one distributing panel, and two for booster and battery; one spare panel being provided for a future engine for which space has been left to the south end of the present plant.

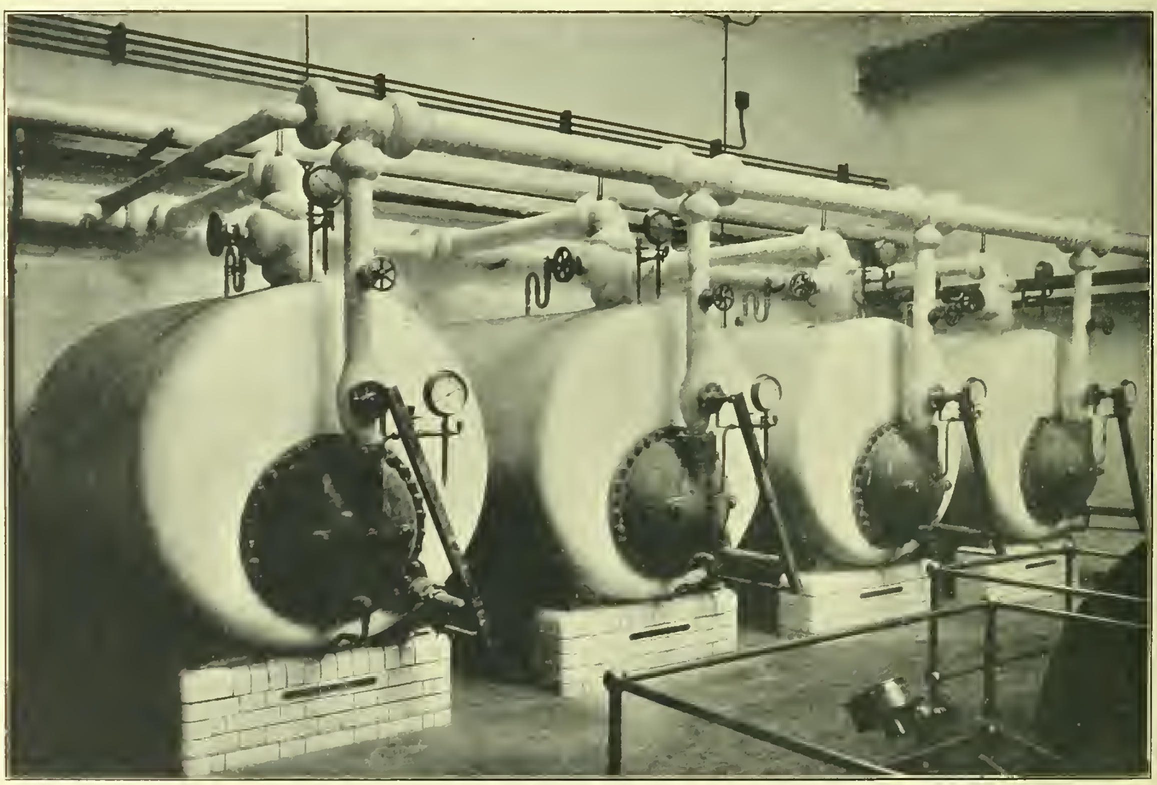
The battery of fifty cells, manufactured by the Chloride Co., is charged through a booster placed close to the switchboard, and has a capacity of 840 ampere hours. The refrigerating plant has been supplied by Messrs. Worssam and Son, and is so arranged that it



REFRIGERATING PLANT.

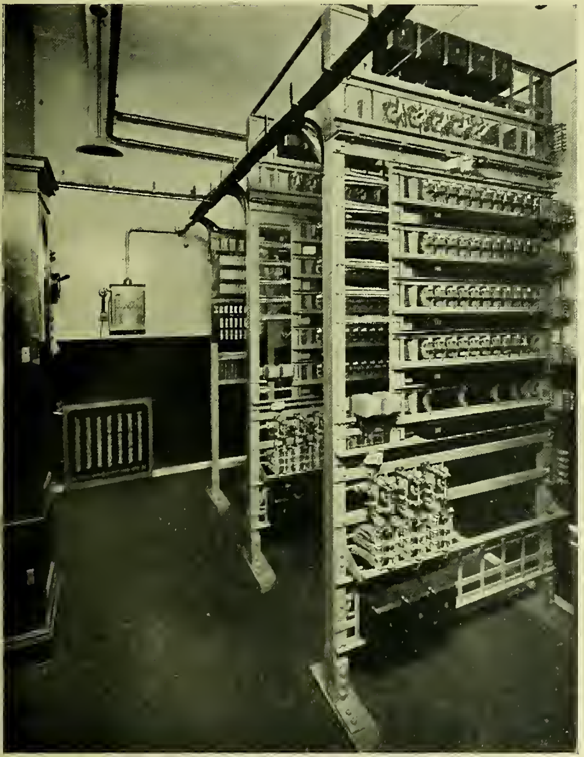
can be used single or double acting, according to the demand. The ice store is so placed that the ice blocks can be delivered from the refrigerating tank direct to the store by an overhead trolley, and, from a door at the other side of the store, from the same trolley, can be dropped on to trucks, in which it is distributed throughout the Hospital.

At the north end of the engine room are placed four calorifiers, supplied by Messrs. James Slater



CALORIFIERS.

and Co., each of 850 gallons storage capacity and each capable of providing 3,000 gallons of water per hour at a temperature of 180° F. to 200° F.



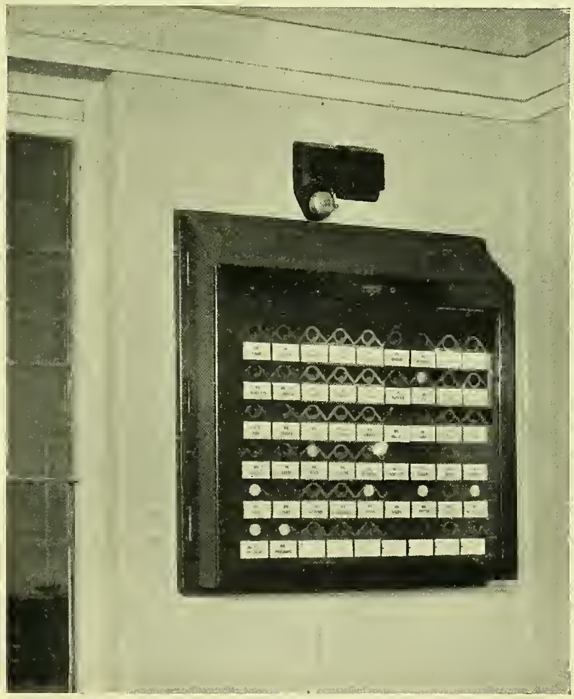
TELEPHONE EXCHANGE ROOM.

A 5-ton overhead hand travelling crane, made by Messrs. Herbert Morris and Bastert, runs on rails stretching from end to end of the engine house.

PUMPING PLANT.

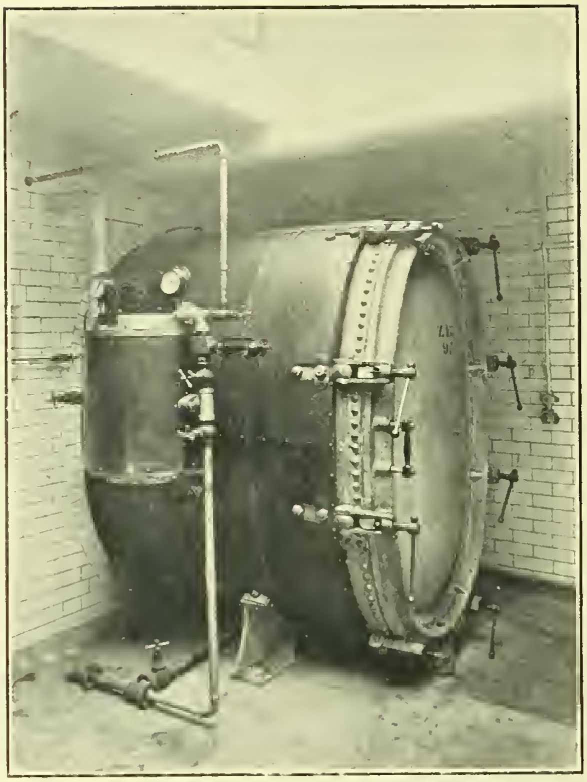
In the pump room there are two electrically-driven vacuum pumps for withdrawing the condensed water and air from the heating pipes through a condenser and delivering into the feed tanks, which are in duplicate and arranged so that complete measurements can be made of the quantities passing through for testing purposes. From these feed tanks two electrically-driven feed pumps deliver water as required to the boilers. The water circulator above referred to for the hot water system is also placed in this pump room and an automatic electrically-driven drain pump for removing any water which may find its way to the floor of this room. This is duplicated by a steam ejector. The whole of the electric motors are controlled from a switchboard placed on a gallery round the upper part of the room on the engine-room floor level.

The main engines are placed on a reinforced concrete bed made in one solid block and insulated by ashes from the surrounding soil. The effect of this, and the special precautions which have been taken by the engine builders, is that no vibration or sound of the engine plant, when running, penetrates into the adjacent wards. Adjoining the main battery room is the telephone exchange room, in which is placed the electrical control mechanism for the communicating telephones throughout the Hospital. This plant has been supplied by Messrs. Siemens Brothers, of their automatic type, so that no operator is required, and inter-communication is obtained entirely by automatic means. A subsidiary battery for operating these telephones as well as the clocks is placed in the main battery room. In the exchange room is also placed the master clock, which controls the whole of the 120 clocks throughout the Hospital.



ARRIVAL OF STAFF INDICATOR (*see also page* 39).

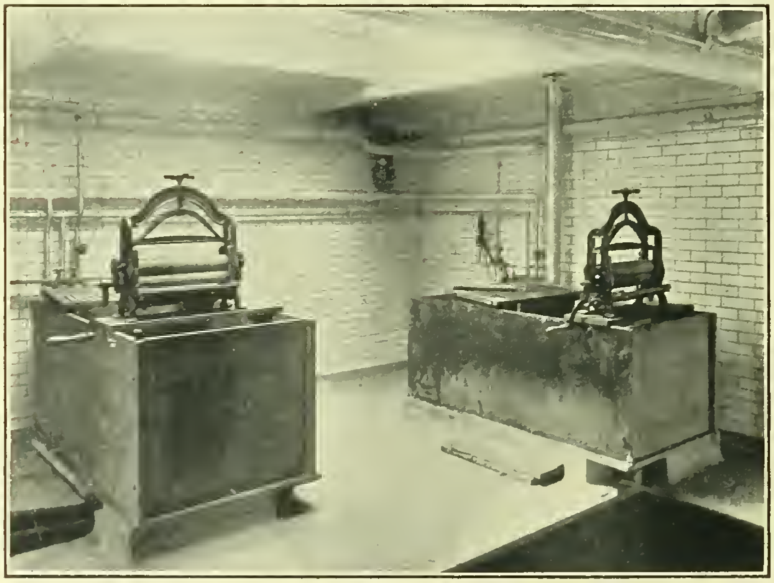
From the same battery which controls the telephones and clocks the electric bells are also controlled, as also are the ten automatic indicators



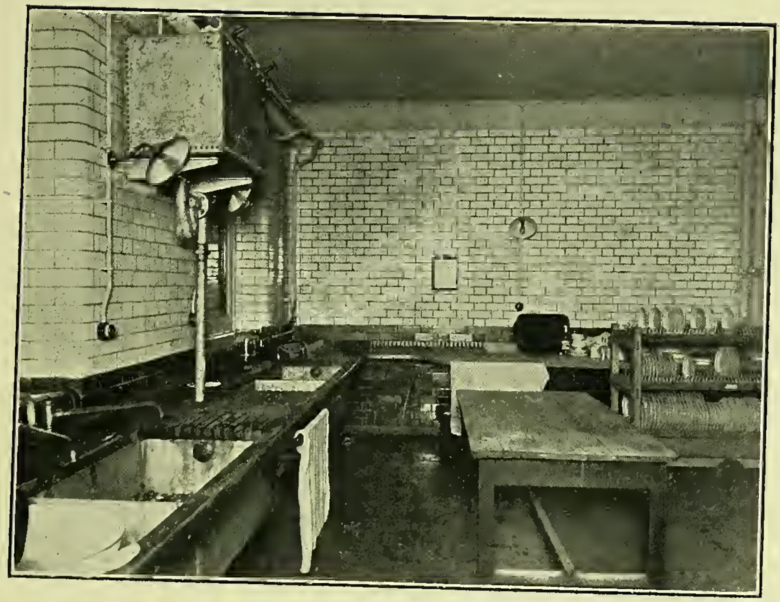
MATTRESS DISINFECTOR.

which show at convenient places throughout the Hospital the arrival and departure of the members of the Staff. These are operated from the porters' lodge at the entrance hall.

In connection with the electric bell system, a special device has been adopted in the nurses' quarters of the Administration Department for rousing the nurses. A gong is placed in each bedroom corridor, the whole of these bells being controlled from one board placed in the matron's office. This board is provided with two sets of pushes and a set of small lamps. On pressing one push the lamp corresponding to it is lighted and so remains until the second push is pressed to stop the bell. In this way complete control is given to the matron, enabling



FOUL WASHING HOUSE.

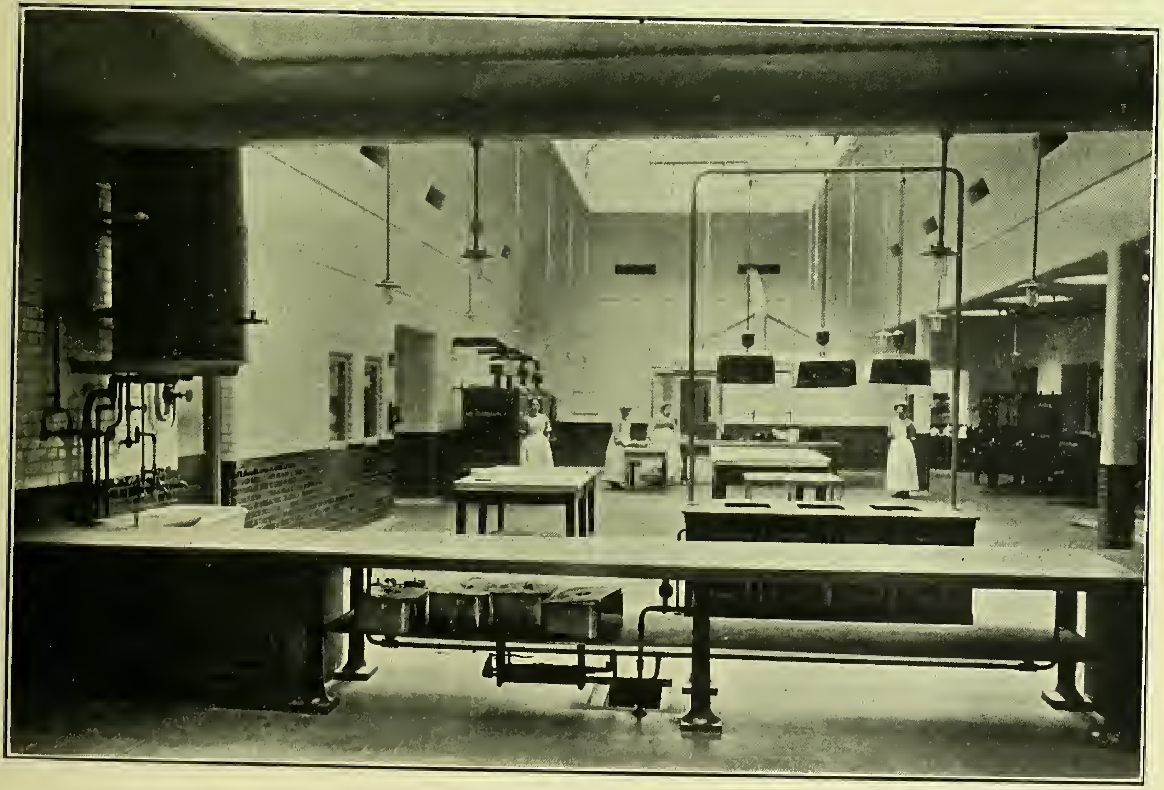


SCULLERY.

her to ensure that every nurse has adequate notice of the time to get up.

FOUL WASHING HOUSE AND DISINFECTING ROOMS.

Outside the engine room, with separate access, is placed the foul washing house and disinfecting rooms. In the foul washing house are steeping tanks for disinfecting and purifying the foul linen brought straight from the wards in sealed receptacles, and a steam jet for sterilising and purifying these receptacles. This



MAIN KITCHEN.

DAIRY.

method of dealing with the foul linen by steeping tanks was required by the Medical Staff of the Hospital in preference to the rotary steam foul-washing machines which are preferred at other Hospitals, the governing condition being that all the washing of the Hospital is to be done at an adjacent laundry, and no washing appliances are at present provided in the Hospital itself.

In the disinfector room is placed a large steam_disinfector, made by Messrs. Manlove, Alliott & Co., to deal with mattresses and other large goods which require disinfecting.

COLD STORAGE.

KITCHENS.

The kitchens (see pages 19 and 31) are fitted with steam and gas appliances provided by Messrs. Slater & Co., who are the contractors throughout the Hospital for all heating, hot water and sterilising supplies. After investigation, gas cooking was decided upon for the ovens and grills, in place of electric cooking, as the latter was considered by the Hospital authorities at that time to be hardly sufficiently advanced to warrant its general adoption. The gas ovens are provided with a special safety device, the tops being provided in two and hinged with counter-balances, so that any explosion inside the oven will open the covers and allow the escape of the exploding gases without injury to those in attendance. The boiling pans are fixed on cantilevers in the walls so as to free the floors from obstruction.

The discharge from these boiling pans is carried through a special device, which enables any steam to pass direct into the heating system of the Hospital and any condensed water to escape to the return main, so as to utilise all the waste heat possible without interfering with the general heating system.

In the potato and vegetable steamers this arrangement could not be adopted owing to the foul nature of the discharge. This, therefore, is the only instance in which the discharge is delivered direct into the drainage system without return to the boiler.

In the scullery (see page 31) is an electrically-driven potato paring machine capable of dealing with the maximum demand in the completed Hospital, and an electrically-driven knife machine in the adjoining room is a further addition to the equipment. A Berkel bacon slicer is also provided.

The whole of the kitchen is very carefully ventilated by extract fans drawing from openings distributed round the kitchen roof and discharging above the level of the Hospital; the position of the kitchen, which is a one-storey block placed in an area surrounded by bedroom and office blocks, rendering prevention of smell of paramount importance. The gas ovens are ventilated into this same system by vertical shafts.

For pasteurising the milk, especially for the Children's Department, pasteurising apparatus has been manufactured and supplied by Messrs. Vipan and Headley.

HEATING PLANT.

As already mentioned, the Hospital is heated throughout by low-pressure steam passing through radiators and heating coils, Messrs. James Slater & Co., Engineers, being the contractors. As a general rule these radiators have been made of the hinged Astro pattern by the National Radiator Co., and have been placed under windows, with a ventilating opening supplying fresh air direct from the outer air behind them. In this way the advantage is obtained of warming the cooled air coming in contact with the windows and obtaining a fresh warmed supply of air, so as to produce ample ventilation, as far as possible, without draught. Radiators of this form can also readily be cleaned and kept free from dust, so that the objectionable stuffiness which is sometimes considered to be a necessary accompaniment of steam radiator heating is avoided. The section of these radiators has been specially designed for the Hospital so as to be entirely free from projecting or recessed surfaces, so as to facilitate cleaning and prevent the deposit of dust. The ventilating openings behind the radiators are provided with baffles, which again have been specially designed, of the hinged louvre type; the whole framework containing the louvre being likewise hinged so that it can be easily lifted up and the smooth opening swept through without the obstruction of internal gratings. Where it has been found necessary to use fixed radiators to suit local conditions, a single flap opening has been specially designed for the Hospital, so that it can be turned right back or completely removed, so that there is no obstruction to a brush passing between the radiator sections, designed of the wide Hospital type, and the air channel can therefore be thoroughly cleaned.

The whole of the main supply pipes for the heating system (and this applies also to the hot water system) have been carried in ducts below the floor of the passages, which, wherever possible, have been made of a large enough section for easy passage from end to end. Where a shallower section had perforce to be adopted, removable covers have been provided at frequent intervals, so that access can be readily obtained to any portion of the pipes.

To avoid the vertical pipes showing on the face of the walls in the main building of the Hospital various ingenious devices have been adopted. In the Administration Block the pipes have been carried outside the building, only the branches directly to the radiators coming through the wall. This, of course, entails special care in the coating of the pipes. In the Ward Blocks the window jambs have been utilised by making the vertical splays hollow. The outside face of these splays has been made by removable concrete blocks fitted with rings with lifting devices, so that access can be obtained to any portion of these vertical pipes if required. The whole of the pipes are, therefore, outside the building, though in a concealed recess in the window splay, thus preventing the necessity of workmen entering the wards should any repairs be required. The floor beneath the radiators is thus kept entirely free from obstruction of pipes, thus facilitating cleaning. All the radiators are fitted with special relief valves and dirt pockets, and the use of traps has been avoided throughout. The dirt pockets enable any solid deposit from the water or from the radiator to be removed without interference with the general system. Such dirt is generally found for a short time after the radiators have been installed, and consists chiefly of the sand which still adheres to the inside of the metal after casting, and the removal of which cannot be entirely ensured at the outset.

In certain portions of the Hospital, principally in basement and laboratories, radiators are dispensed with and uncovered pipes are carried round the rooms near the ceilings. This method of heating has many advantages where the possible difficulty from dust collecting on the pipes and dropping on to the floor below is not of grave importance.

Further, in the case of laboratories, it avoids the objection found where, from the exigencies of space, the attendants have to sit close to the hot surface of the radiator, and it further clears the walls and floor of obstructions to shelving or laboratory apparatus. The heating effect, though possibly slower in attaining its maximum than where the heating surface is placed near the floor, is quite as efficient, and, indeed, is generally preferred by those who have to use the room.

Dispensary.

In the dispensary a complete installation for distilling and preparing drugs, as well as machinery for tablet making, etc., has been provided to the consulting engineers' specification, and manufactured by Messrs. Brown and Sons. The boiling pans and stills are supplied with a direct steam supply from the boiler through a reducing valve, and the machinery is electrically driven.

Operation Theatres.

In the main operation theatres the heating has been arranged on a somewhat different system.

As provision has to be made for heating these rooms at all times of the year, both during winter and during summer, when the main heating of the Hospital will be cut off, a special separate steam main has been taken to a calorifier in the basement of one of the operation blocks. From this calorifier hot-water pipes connect to special panelling. On this system small diameter pipes are sunk in the plaster of the walls and ceilings, so that there is no visible or projecting heating surface upon which dust can lodge. The walls and ceilings over the heated areas are composed of Durato, which has an expansive co-efficient similar to that of the hot pipes, and so prevents any cracking of the surface under wide limits of temperature.

The heating is arranged in sections, which can be cut off individually, so as to regulate the temperature. In this way the walls and ceilings will always be warmed.

So as to prevent a reduction of temperature in the room by the introduction of fresh air for ventilation purposes there is an auxiliary battery of radiators placed in chambers underneath each theatre. The ventilating air passes through these batteries after suitable cleansing, enters the theatre near the floor, and the foul air is drawn up into spaces surrounding the coving of the theatre roof, whence it is ejected by propeller fans.

The valves for controlling both the panels and the heaters for warming the ventilating air are placed in one of the auxiliary rooms or in an adjoining corridor, and the operation theatre itself is, therefore, free from all projections of any sort.

By suitable regulation any required temperature up to the maximum can be quickly obtained, and the quantity of air for ventilation can also be varied between wide limits by variation of the speed of the fans and by regulation of the inlets by specially designed inlet valves.

Wards.

In the wards the main heating and ventilating is provided by open-hearth stoves placed in the middle of the floor towards each end of the ward, and provided by the building contractor.

Radiators have only been inserted so as to supplement this heating during specially cold weather, and provision has been made for increase in their number should it at any time be required.

Sterilisers and water stills are heated by steam from a special steam main.

HOT WATER SUPPLY.

The hot water is arranged on the drop-pipe system, being led from the calorifiers direct to tanks in the roofs of the ward blocks on each side of the power station. From these tanks the water drops down to the various services throughout the Hospital, the pipes being collected in the basement and returned along the basement ducts to the calorifiers.

In all the bath rooms of the Administration Block hot water is supplied to the baths through waste preventer tanks, which are kept constantly hot by a circulating coil from the hot water system passing through the tanks. In this way sufficient hot water for a bath is supplied by a single pull, and the excessive waste which is liable to occur, due to hot water being turned on and (as is likely to happen in a Hospital) forgotten when attention is called off, is prevented, and an adequate supply of nearly boiling water is always ensured.

In the duty rooms to the wards, and in certain other parts of the Hospital remote from the kitchen, certain services are heated off the hot water system, so as to enable the steam-heating mains to be closed down in summer. Such services are, for example, the hot serving closets in the duty rooms for the wards, etc., the heating coils in the linen rooms, and patients' clothes rooms, the towel and blanket rails, and the bed-pan racks, etc., in the wards, and operating theatres.

There is another service coming under this heading, a description of which may perhaps be of interest. In the duty rooms to the wards an electric tea-making and egg-boiling apparatus has been provided of special design. So as to avoid the large waste of current which results from boiling water up from cold, a cylindrical containing vessel has been provided filled from the main drinking water system and heated by internal coils connected with the hot water main. From this reservoir the tea urns and egg boilers can be filled as desired; electric current simply being required to complete the boiling process. In this way very considerable economy is effected. The egg and tea boilers are made interchangeable in case of breakdown, and into either of these milk saucepans or egg poachers can be inserted, so that a wide variety of work can be obtained from the same outfit. This installation has been manufactured by Messrs. Slaters, as in the case of many of the other special fittings, to the designs of the consulting engineers.

The hot water bottles for the wards are stored in specially designed tanks, filled with water kept constantly hot by coils from the hot water system, so that the bottles are immediately available for use.

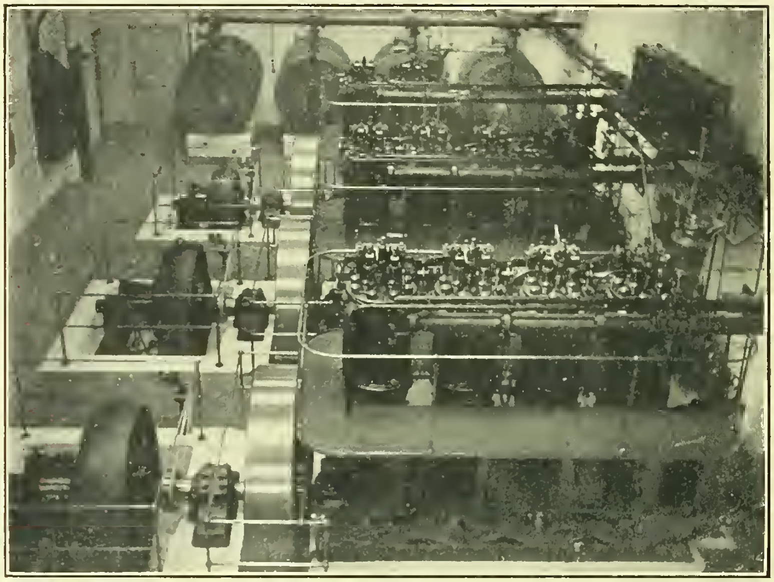
ELECTRICITY SUPPLY.

As already mentioned, the electric supply is at 100 volts, and, as there is a considerable power load provided by the auxiliary electric plant, the electric ventilating fans, lifts, boiling apparatus, and sterilisers, the motor for the organ blower, as well as the X-ray and other electrical departments, the mains have been arranged so as to separate this power load for measuring purposes from the lighting load. There is in addition a separate main for the control of pilot lights throughout the building and of the external lighting.

Without entering into too technical a description of the installation there are certain features which will interest our readers.

The supply mains to the main switchboards in the various departments have been carried from the central station through the tunnel already mentioned, and through the sub-floor ducts, as bare copper strip conductors on porcelain insulators. Great care has been exercised to protect these mains from any risk of short circuiting and injury. In all cases the negative earthed wire cable has been placed in such a position as to protect the other mains from accidental contact, and, where any chance of contact otherwise arises, special guards have been inserted. Access to the ducts and ways along which these bare leads are carried is only permitted to authorised persons, and an adequate system of lighting has been provided by pilot lights or portable lamps in these ducts.

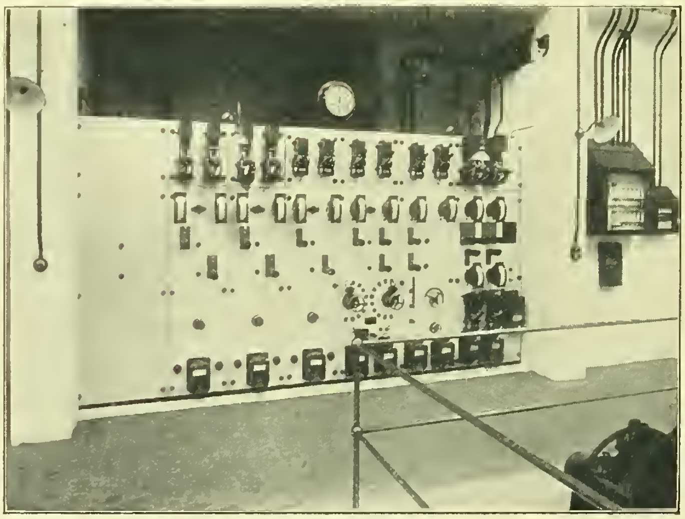
From the main switchboards vulcanised insulated rubber conductors are led, either in special half-round section wooden casing on the surface as, for example, in the Out-patients' Department and the Isolation Block, or, where the wall surface was required to be kept free from projections, it has been buried in steel tubing in the walls.



GENERATING PLANT.

On the switchboards and distributing boards throughout the Hospital the switches and fuses have been mounted on white marble blocks, the casing being made in teak of special design with a top sloping at 45 degrees to the wall, so as to facilitate cleaning and render readily visible any dust deposit.

Throughout the Hospital, wherever patients have access or medical or surgical work is carried on, the utmost care has been taken to design all fittings, whether pendants, brackets, plugs or switches, of a form which will be easily cleaned and allow as small a projection as possible for dust.



MAIN SWITCHBOARD.

All the pendants are made of plain tubing with no ridges or projecting portions of any sort, having been specially designed for the Hospital.

In the wards the Medical Staff required a bracket light over every bed, so that each patient can individually be supplied with light. Close under each bracket there is a plug socket, so that an examination light can be used without the flexible connection having to be led across the floor, which causes so much difficulty and trouble.

The instrument sterilisers, etc., are of the electric type, as also are the bronchitis kettles.

In the operation theatres a special operating fitting has been designed which, in the Out-patients' Department, has been made so that it can be lowered, to give ready access to every portion of it for cleaning purposes. It has also been arranged entirely free from dust-collecting projections. In the main Operation Blocks, where, from the design of the room, access can be obtained without lowering the fitting, it is of a simple swing-arm type.

BED LIFT.

Provision has also been made in these rooms by plugs of suitable amperage for supplying current for cauteries, cystoscopes, and other special fittings, all of which are electric.

In the Gynæcological theatre a special light is being fitted by Messrs. R. and J. Beck, which consists of a powerful arc lamp searchlight outside the theatre itself, which projects a beam, through a window with cooling chamber, on to mirrors, so that the beam of light can be projected to any required part of the patient under operation. By a simple adjustment of mirrors the beam can be either concentrated or diffused. As auxiliary lighting round this and all other theatres, brackets of special design have been fixed on the walls.

LIFTS.

The electric lifts have been supplied by the Otis Elevator Co., and are all of the push-button type, so as to dispense with the necessity of an attendant.

To avoid risk of accident special precautions have been adopted. The lift cages are made to fill the wells, and the wells themselves have been made flush from top to bottom, so that in passing any door there is no projection from which accident can arise. The gate locks have been specially designed for the Hospital, so that the risk of pinching the fingers in the opening and shutting of the Bostwick gates is eliminated. Further, the contacts are arranged so that, if any person has once got access to the cage, no other person can interfere with the working of the lift, this being an addition to the usual precaution which prevents the working of the lift when any door is open, and prevents the door from being opened unless the cage is opposite to it.

The general system on which the lifts are arranged is that a large lift adjoins the main staircase for beds and passengers. At some little distance on either side are service lifts. Diet lifts are also provided for conveying the food from the kitchen to the nurses' and other dining-rooms.

Further, there are separate lifts in the nurses' quarters.

In the Out-patients' Department bed lifts are also provided.

In all there are ten electric lifts and two hand lifts, and provision is left for additional lifts if required.

VENTILATION.

The ventilation of the Hospital has been as far as possible provided by natural means, but in a number of cases it has been found advisable to supplement this by mechanical fans.

In the Out-patients' Department, from the design of the building, there is difficulty in obtaining complete ventilation by natural means. It was, therefore, decided that a certain number of fans should be inserted, and these have been arranged according to the requirements of each particular position, either of the positive type or of a simple propeller type. For example, in the main waiting hall, where a large number of people will at times be assembled, this building being surrounded on all sides by consulting rooms and other buildings, fresh air inlet ducts have been arranged under the floor, from which air is first led up through gratings and baffles past the radiators placed round the room, and a further supply has been brought into the centre of the room through heaters placed in enclosures in the refreshment buffet.

Openings are further provided in the ceiling communicating with the hollow roof, and from this space propeller fans, 5 feet in diameter, draw the foul air from the hall and discharge it into the outer air. For the surrounding buildings roof ducts have been formed of concrete, carefully designed so as to graduate the flow of air, with communicating branches at easy angles and of carefully calculated cross section leading from the various individual rooms. The openings into these communicating chambers are, in general, placed in the ceilings of the rooms, or are taken through the framework of the skylights, gratings having been dispensed with except where absolutely necessary, so that no obstruction should be given to the discharge and to reduce the amount of cleaning necessary.

At the ends of the main roof ducts positive fans have been placed in specially arranged chambers. These fans are electrically driven, starting and regulating switches being placed close to the motors in the fan chambers. These switches are connected by relays from tumbler switches placed at convenient places in the corridors or rooms below. In this way the starting and stopping of the fans is under the control of the attendants in the various rooms, whereas the speed regulation is under the direct control of the engineering staff.

In all cases, as has already been said, where radiators are placed against outside walls, air is admitted through the radiators, so that the combination of the two arrangements provides an adequate renewal of the air in every room in the department with a minimum of draught.

In other portions of the Hospital, where natural ventilation could not entirely be relied upon, similar provision has been made.

In the Administration Block all the nurses' and staff bedrooms have been warmed and ventilated by admitting air from the corridors, to which fresh heated air is supplied past the radiators through fanlights over the doors.

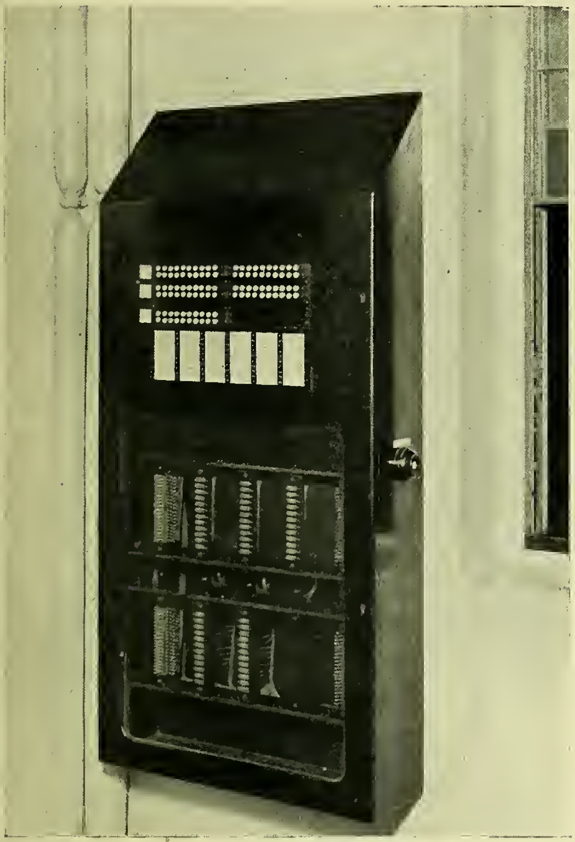
An exit opening has been inserted near the floor underneath the beds, so as to prevent as far as possible the blocking of these openings so frequently met with. These openings communicate with upcast shafts leading into the hollow roof, which has been ventilated by a through draught from openings at each end. These openings have been designed and prepared for the insertion of fans if required, but it is anticipated that there will be no necessity for inserting them.

In the lecture theatre of the Medical School, which from its design necessitates special treatment, air is admitted through screens and a battery of heaters placed in the roof, and through openings in the upper part of the room.

The used air is then drawn out through openings under the seats of the auditorium and discharged by a positive propeller fan into the atmosphere.

In the dark rooms of the X-ray and other departments special light-tight ventilators have been provided, admitting air from the outer atmosphere but excluding all light.

The artificial ventilation throughout has been carried out by the contractors for the heating, Messrs. James Slater and Co., Ltd.



PUSH-BUTTON SIGNALLER FOR STAFF (*see also page* 29).

CONTRACTORS.

STEAM GENERATING PLANT, HOT WATER SUPPLY, HEATING AND VENTILATING, AND GAS INSTALLATION :

Messrs. James Slater & Co., Ltd.

GENERATING PLANT AND ELECTRICAL INSTALLATION :

Edmundson's Electricity Corporation.

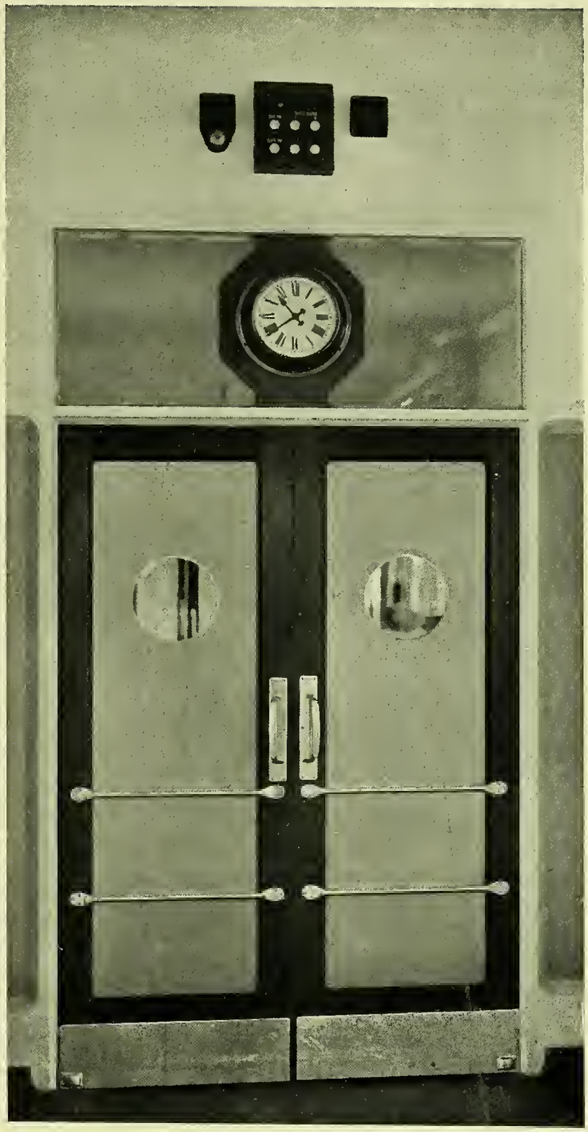
Messrs. John Bolding & Sons.

Messrs. Duncan Watson & Co.

TELEPHONE AND AUTOMATIC CLOCK INSTALLATION :

Messrs. Siemens Bros. & Co., Ltd.

Siemens Bros. Dynamo Works, Ltd.



WARD DOOR, SHOWING AUTOMATIC CLOCK AND ARRIVAL OF STAFF INDICATOR.

SUB-CONTRACTORS.

RADIATORS :
National Radiator Co., Ltd.

DISINFECTOR AND STERILIZER :
Messrs. Manlove, Alliott & Co., Ltd.

LIFTS :
Otis Elevator Co., Ltd.

ELECTROLIERS :
Messrs. Faraday & Sons.
Messrs. F. and C. Osler.

STORAGE BATTERY :
The Chloride Co.

X-RAY APPARATUS :
Messrs. W. Watson & Sons.

DRAINAGE, WATER SUPPLY, AND FIRE MAIN.

The general drainage system of King's College Hospital comprises a series of eleven main drains, running from south to north, and connecting in Bessemer Road with the public sewer, which in turn discharges into a larger sewer in Denmark Hill. Eventually there will be another main drain running from west to east to serve Ward Blocks Nos. 1, 2, and 3 that have not yet been built, and this drain will have its outfall in Denmark Hill.

A Hospital, and, indeed, every large building, should possess several independent outfalls for the drains, so that in the event of any drain becoming choked, or having to be cut to provide for extensions, as small a section of the Hospital as possible may be affected, and a minimum amount of interruption caused to the work of the institution. Of scarcely less importance is it that the drainage system should be periodically tested with but little inconvenience to the Staff, and reliable tests cannot be carried out in this way where a single drain serves the whole building, or even a large section of it.

Unfortunately, the Bessemer Road sewer, which was constructed not long before the preparations for the contract scheme for the Hospital were begun, was laid without reference to the characteristics of the Hospital buildings, one principal feature affecting the drainage scheme being the long main corridor crossing the drains at right angles and forming a sort of retaining wall with the ground level on the south side some 13 feet above the courtyards and basement of the Administration Block on the north side.

The effect of this sudden drop is to do away with the gentle slope of the original site towards the road, and for a distance of 250 feet from the road, to substitute a stretch of courtyard and basement which is practically level. Had the sewer been laid deeper, as it no doubt would have been had the design of the Hospital been known at the time, several of the drains could have been given a far better fall than has been possible, and they could have been reduced in size.

The whole of the underground drains consist of heavy cast-iron pipes, caulked with molten lead and laid on a bed of concrete, and they have been given the best gradients which were found practicable. The pipes vary in size from 3 inches to 9 inches, and their gradients from 1 in 30 to 1 in 115.

The sewage drains are coated with Dr. Angus Smith's preservative solution, but, in the case of drains carrying rainwater only, further protection against rust has been provided by having the pipes either galvanised or sherardised.

Brick manholes have been provided in the usual way at changes in line and gradient of the drains and at points where drains join one another. The manholes are fitted at the ground level with the usual cast-iron frames and covers, and where it has been desired that the covers should be unobtrusive, they have been recessed and filled in with asphalt, or stone, or whatever the material may be which forms the surrounding surface.

Frequently the brick manholes even on iron drains are provided with open channels in the floor to carry the sewage, and wherever this is done the manholes become storage chambers for foul air, and in the event of a chokage the sewage rises in them and they are converted into cesspools for the time being.

The better method is to provide the iron drains with bolted iron covers where they pass through the manholes, and by making these covers airtight, neither foul air nor sewage can find its way into the manhole. This is the system which has been adopted at King's College Hospital, and the iron covers can at any time be unbolted either for clearing a chokage or for cleansing, and, if need be, disinfecting the pipes. These access covers have been freely used, and their cost may be regarded as an insurance premium against any serious interruption of the drainage system.

One great advantage of these airtight covers is that, where they are installed, a thoroughly reliable test of the drains can be made without opening the manholes, and without putting the drains themselves out of use during the process of testing for anything like the length of time that would otherwise be necessary.

The test referred to, which is known as the air test, can be conveniently applied, after closing all ventilation openings to the drains to be tested, by blowing air into the pipes through a rubber tube until the pressure, as registered by an ordinary gasfitter's gauge, is sufficient to support a column of water an inch or two in height. If the drain under test is sound, none of the air which is under pressure can escape, and the water level in the gauge remains steady. On the other hand, if there is a defect the air finds its way out, the pressure of the remaining air is reduced, and the gauge shows that the column of water it is capable of supporting is no longer as high as before. Thus the air test, equally with the water test, gives a positive result, and is not like the smoke test and the chemical test, which, when applied to a sound drain, show no result, and occasionally do the same thing when the drain is defective.

As far as possible all drains have been kept out of the pipe ducts, in order to avoid any possible risk to health from an inspection cover being carelessly left off. A few rainwater drains, however, which are trapped off from the sewage drains, have been run in the ducts, subways, and coal cellars, in which positions they are carried on iron cantilever brackets built into the wall or slung from the ceiling, or else supported on brick piers.

If drains are to be self-cleansing, not only should they be given good falls, but they must be well flushed. In order to secure this the upper ends of many of the main drains have been arranged to receive the waste water from the bathrooms in the sanitary annexes of the Ward Blocks, and the baths have been fitted with large outlets so that they may empty quickly.

Those drains which could not be flushed by means of baths have, where it seemed desirable, been provided with flush tanks, which slowly fill with clean water from the main and then automatically give a rapid discharge. Such tanks, for instance, have been fitted in the sculleries in order to break up and get rid of the grease, for grease, when it is allowed to solidify in the drains, often causes trouble.

Every drain, after being laid and before being covered up, was tested with water by means of a standpipe carried up to 25 feet above the level of the floor of the main waiting hall, the object being to prove that it was quite sound under a greater pressure than it would be subjected to in actual use. After the drains had satisfactorily passed the water test, the air test was applied to them in the way already described.

On the completion of each block, the air test was reapplied, and it is specified to be applied for the third time just before the sanitary work is finally taken over and the contractor's responsibility for it ceases.

In order to reduce the amount of plumbing work to a minimum, where practicable, all baths, sinks, and lavatory basins have been arranged to discharge into surface channels in the floor.

In some cases it has been found feasible to give the whole floor a slight fall to the channel, and the convenience of this when using a hose and squeegee for cleaning is obvious.

Each floor channel is laid to a fall, and the outlet at its lower end is connected to a 3-inch white enamelled cast-iron trap, which discharges into a gully in the open air. The inlet to the trap is protected by a very open grating of aluminium, which, unlike the ordinary pattern, allows it to be readily seen whether the trap is clean or not, inspection being further facilitated by the white enamel.

In order to keep the traps in view, care has been taken not to place them immediately under a sink or basin.

Ordinary white enamel as applied to cast-iron is somewhat easily acted upon by acids which are used in Hospital practice, and, therefore, a special enamel capable of resisting strong nitric and hydrochloric acid has been employed in coating the traps.

Each main drain is separately trapped off from the sewer in a disconnecting manhole at the Bessemer Road boundary. The pattern of intercepting trap adopted is the "Renor," which possesses the advantage of allowing any obstruction in the trap being removed from the sewer side, an operation which is usually impossible. The traps, like the drains, are of cast-iron.

The main drains are ventilated independently of one another, a fresh air shaft being provided at each disconnecting manhole.

The inlet heads to the fresh air shafts are fitted with mica flaps arranged on vertical pivots, instead of being suspended, as is usually the case, from their upper edges. This form of flap is more sensitive than the ordinary pattern.

The life of a mica flap is sometimes a short one, in consequence of its vibrating rapidly against the grating upon which it closes. The vibrations are due to the fluctuations in air pressure in the drain close to the intercepting trap when much water is passing.

Two methods of guarding against this have been adopted, one being, where possible, to prevent pressure variations arising, and the other to restrict the variations when they do occur within fixed limits.

By running a branch drain off the disconnecting manhole and ventilating its upper end, no air pressure worth consideration can take place in the drain, because the branch at once relieves it. This is how the first method is applied.

The second method consists in bridging or short-circuiting the "Renor" trap by a pipe with an adjustable aluminium valve upon it. The valve, though normally closed, opens to allow air to pass from the drain to the sewer, but remains closed against any air which tries to pass from the sewer into the drain.

Soil Pipes.

The soil pipes are constructed, generally speaking, of cast-iron, with inspection doors at bends and junctions to allow of the ready removal of any obstruction and for thorough cleaning and disinfection.

The upper or ventilating ends of the soil pipes, where taken up the slopes of roofs, are, chiefly for appearance sake, in lead.

In some cases it was not easy to decide where the soil pipes should terminate owing to the proximity of windows, skylights, ventilating shafts, and chimneys, especially as they could not be allowed to show too prominently.

In the case of the sanitary annexes to the Ward Blocks, the ventilating pipes have been grouped together in the roof and carried up side by side as a finial which, unless carefully scrutinised, would not be thought to have any connection with the drainage system. but to be merely an architectural feature.

All soil pipes were tested before the closets and slop sinks were fixed by being filled to the top with water, and, after the fittings had been connected to them, they were tested with air.

Main Waste Pipes.

The main waste pipes are of galvanised cast-iron, and, to provide against the injury that is frequently caused by the passage of hot water, they have been fitted with expansion joints.

The ventilating portions of these pipes, where carried up the slopes of roofs, have been treated like the soil pipes and extended in lead.

In some cases it was found necessary to carry the pipes across a flat or some open space, and here resort was had to galvanised wrought-iron pipe on account of its greater strength and its neater appearance.

The waste pipes, including the traps of the floor channels, were tested with water and with air like the soil pipes.

Water Supply.

The Hospital authorities decided against having their own well and in favour of obtaining their supply from the mains of the Metropolitan Water Board.

The Board have a 16-inch high-pressure main in Denmark Hill with a pumping station at one end and a reservoir at the other, and this main was cut opposite the Hospital buildings, and a sluice valve inserted upon it. A connection was then taken off the main from each side of the valve and brought into the Hospital buildings.

If this main were ever to burst, the fault would of necessity be on one side or other of the 16-inch valve, and, if it were to take place on the reservoir side, the valve would be closed and a supply obtained from the pumping station. If, on the other hand, the burst occurred on the pumping station side, the valve would be closed and the supply drawn from the reservoir. It will thus be seen that there is very little risk of the Hospital being left for more than a few minutes without a full supply of water, but to make matters trebly safe, at the suggestion of the Water Board, a third branch has been run from the Board's low-pressure main in De Crespigny Park, which would come into operation supposing that anything so unlikely as two bursts at the same time occurred on the Denmark Hill main. Virtually, therefore, the Hospital has three independent sources of supply.

The Board's meter is placed inside the Hospital, instead of in a manhole in the road, and a recording pressure gauge has been fixed close to it, so that a permanent continuous record may be kept of the pressure.

In order to carry out the instructions of the Building Committee, that every cold water fitting throughout the Hospital should be supplied off the main direct, the Hospital water main had to be large enough to supply all the buildings during that period of the day when water, both hot and cold, is in greatest demand, and, although there was no difficulty in ascertaining from the records of other Hospitals of similar size what total amount of water would probably be used per diem, no data of the maximum consumption during any given hour of the twenty-four were available, and the problem of the size of main to be adopted did not lend itself to any form of accurate calculation.

The main is of cast-iron and varies in size from 10 inches to 4 inches. All branches over 3 inches in diameter, and all branches buried in the ground, are cast-iron, but the remainder, with few exceptions, are wrought-iron. The cast-iron pipes are jointed with molten lead, no yarn being used in the joints. Sluice valves have been provided on all branches, and provision has been made for a water meter to be readily placed on any branch, so that the consumption in any part of the Hospital may be ascertained when desired.

The amount of storage of cold water to be provided was fixed by the Committee at 20,000 gallons, and this volume is contained in a pair of cisterns constructed of riveted steel boiler plates, and situated in the turrets on the roofs of the two centre Ward Blocks.

The cisterns are each 14 feet high and 13 feet in diameter, and take the form of closed tanks, and access to them is obtained through manholes on the top, which are fitted with air-tight covers. They are painted internally with siderosthen, and the connecting mains are provided with valves so that in the event of any interruption to the supply from the Water Board's system the cisterns can be made to serve the whole network of cold water pipes in the Hospital.

The specified hydraulic test for the water mains and services is 120 lbs. per square inch at the ground level near the main entrance.

FIRE MAIN.

The fire main and its branches are supplied from the Water Board's high-pressure main already referred to, and the same three-fold precaution against failure in the domestic supply has been adopted in regard to the fire service.

The main runs through the pipe subway and basement, and the branches rise from it to the hydrants on the different floors.

The hydrants are of Messrs. Merryweather's "Metropole" pattern, the handwheels being of cast-iron, in order to reduce the quantity of bright gun-metal which needs polishing to a minimum.

Below each hydrant is a 1½-inch cock for filling fire buckets.

The fire main and its branches were tested under a hydraulic pressure of 200 lbs. per square inch.

For the drainage work, as well as for the water mains and services and the fire mains throughout the Hospital, with the exception of the Out-patient (and Casualty) Department, Messrs. Matthew Hall & Co. were responsible as sub-contractors, under the general contractors, Messrs. Foster and Dicksee; Messrs. Doulton being the sub-contractors for the corresponding work in the Out-patient Department.

ROYAL COLLEGE OF SURGEONS OF ENGLAND
20 JAN 1[illegible]
LIBRARY

NOTES ON MATERIALS.

Asphalte.—30,000 yards super of asphalte were supplied and laid by the Limmer Asphalte Co., for the floors of the corridors, flat roofs, etc.

Bacon Slicer.—The Berkel Slicer is being adopted in the kitchens of Hospitals, Infirmaries, Asylums, and similar institutions, by reason of its great capabilities as a time-saver and preventive of waste. It slices with great rapidity any class of meats (hot or cold), bacon, bread, etc., in a fraction of the time occupied by hand, and in a far more satisfactory manner, as every slice reaches the patient or inmate, uniform in thickness, so that the diet can be regulated to a nicety for each person. Mention should also be made of the great saving in rations effected by its use. In some cases a saving of 19 lbs. per day was effected. The shredding of meat for beef-tea is also performed to perfection in less time than it formerly took three of the kitchen staff to do the same amount of work.

Blinds.—Flexwood Shutters have been fitted in the Ophthalmic Department, Operating Theatre, and in No. 9 block for shutting out light. These blinds or shutters are made of wooden laths cut obliquely and threaded on to steel ribbons so as to keep out sun or rain, while allowing of free ventilation, and are greatly appreciated in connection with the outdoor treatment for consumption. A polished oak Flexwood Shutter has also been fitted to the Serving Hatch of the nurses' dining hall.

Bricks.—All the stock bricks were supplied by the London Brick Co. 270,000 No. 5 Light Cherry Red Facings and 64,000 No. 9 Cherry Red Rubbers for the main building dressings were supplied by Messrs. Thomas Lawrence and Sons, Bracknell, Berks.

Calorifiers.—Those for the main system of heating were supplied by Messrs. James Slater & Co., Ltd. Those for the panel system of heating were supplied by Messrs. Royles, Ltd.

Clocks.—The automatic clocks throughout the building were supplied by Messrs. Siemens Bros. & Co., Ltd.

Disinfector.—The mattress disinfector was supplied by Messrs. Manlove, Alliott & Co., Ltd.

Distemper.—The ceilings throughout the Hospital have been finished in Duresco, of which seven tons were supplied.

Doors to the number of 700 of the well-known Gilmour Patent make were supplied. These doors are smooth both sides, and when required with glass, such as in corridor doors, have a circular light for glass. A special, and we understand, entirely new feature is to be found in the doors of the operation rooms. These, too, have circular lights for glass, but are flush glazed, this flush glazing being effected without breaking the smoothness or flush surface of the door on either side. All the doors are made in plain white oak stained by the Gilmour Door Co., to represent teak.

Drain Pipes.—Every drain pipe was specially cast and each pipe bears the initials, K. C. H.

Fire-Places.—Most of the fire-places were supplied by the Teale Fire-Place Co., Ltd.

Floorings.—The floors of the corridors are in asphalte the stair-treads and operating theatres in terrazzo, the floors of all wards, out-patient consulting rooms, Electrical and Massage Departments, Casualty Department, Dental Department, Twenty-four Hours' Ward, and all the ward ante-rooms are done in Durato Asbestos Flooring. In some of the wards the top surface is linoleum with Durato sub-coat. The Durato supplied is of the mottled variety, in brown and buff, with a black veining.

Glazing.—All the glazing work throughout the building was carried out by the London Sand Blast and Decorative Co.

Ice.—The installation for manufacturing ice was supplied by Messrs. G. J. Worssam and Son, Ltd.

Lifts.—Ten lifts of the push-button type were installed by the Otis Elevator Co., Ltd.

Organ.—The organ in the Chapel, which is of beautiful tone, was supplied by Messrs. Norman and Beard, of Norwich.

Paint.—The walls of the corridors throughout the Hospital, the Dispensary, X-ray Department laboratories, kitchen and laundry, are finished in a special shade of Ivory Glossy Paripan. The walls of the Chapel are finished in a special shade of Ivory Flat or dull Paripan, and the walls of all wards in semi-glass Paripan of duck-egg green shade. The effect of the various finishes will be appreciated on reference to the numerous illustrations throughout this work.

Plaster.—All the plaster work was done in granite silicon plaster supplied by the Granite Silicon Plaster Co., Ltd.

Polish.—All the teak wood floors, teak and oak fittings, including doors, panelling, window frames, and interior woodwork throughout the building were polished with "Ronuk." In the Chapel the floors, pews, pulpit, window frames, organ casing, and doors were also polished with "Ronuk."

Steriliser.—The large steriliser to serve the operation theatres was supplied by Messrs. Manlove, Alliott & Co., Ltd.

Telephone.—The telephone installation was carried out by Messrs. Siemens.

Window-Sash Fittings.—4,680 sash hangers with fittings and 3,000 reversible sash fittings were supplied by the Rhodes Patent Sash Hanging Co.

X-Ray Apparatus.—The whole of the X-ray apparatus was supplied by Messrs. William Watson and Sons, Ltd.

HORLICK'S MALTED MILK

**MALTED BARLEY, WHEAT
and MILK in Powder Form.**

NO ADDED MILK OR COOKING REQUIRED.

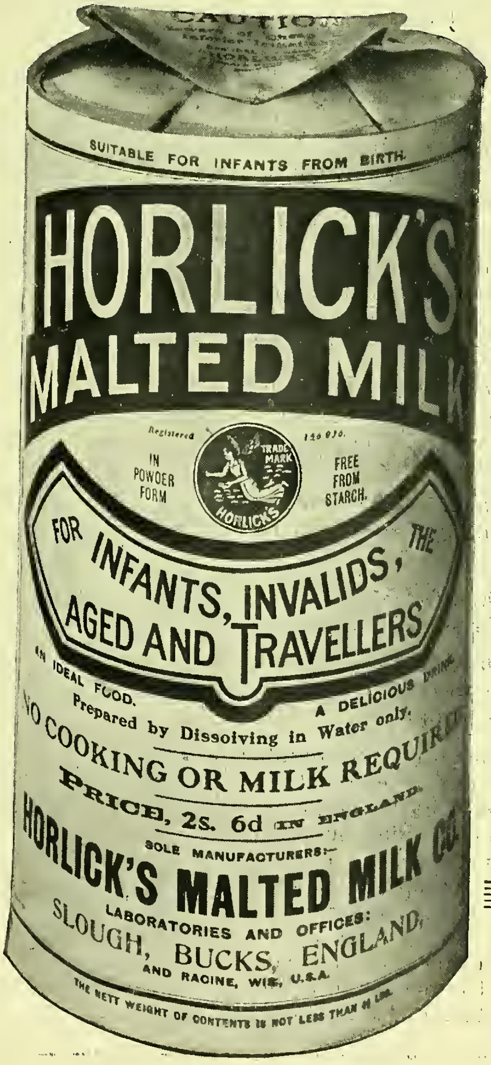
Horlick's presents all the unrivalled food value of pure full-cream milk enriched and modified with the soluble nutritive extracts of choice malted Cereals.

Its utility is based not alone on chemical qualities, but also on the possession of certain physical attributes, *e.g.*, palatability, solubility, ease of digestion and assimilation, etc., qualities, moreover, which cannot be ignored in the discussion of dietetic values. It is also true that the record of our product as a nutrient, for almost thirty years, bears irrefutable testimony to the genuineness of its physiological worth and its general excellence as a food product.

SPECIAL CONTAINERS AND PRICES TO INSTITUTIONS.

Liberal supplies for trial in either Private or Hospital Practice complimentary and carriage paid on application.

**HORLICK'S
MALTED MILK CO.
SLOUGH, BUCKS,
—ENGLAND.—**



HOSPITAL LIGHTING.

You can enjoy the many advantages offered by a better light and reduce your Electricity bill if you will insist on **WIRUMS** when you are next installing Electric Lamps.

Further, in **WIRUM** you obtain a lamp that is nothing short of wonderful, on account of its strength; this would mean a reduction in your lamp bill, too.

There is quality and tone about the light imparted by a **WIRUM** Lamp—it is a light that carries comfort in its rays, and makes you feel at ease.

Therefore, use **WIRUM** Lamps for
HOSPITAL LIGHTING.

THE BRIMSDOWN LAMP WORKS, LIMITED,
: 12, KINGSWAY HOUSE, LONDON, W.C. :

MANLOVE, ALLIOTT & Co., Ltd.,
NOTTINGHAM.

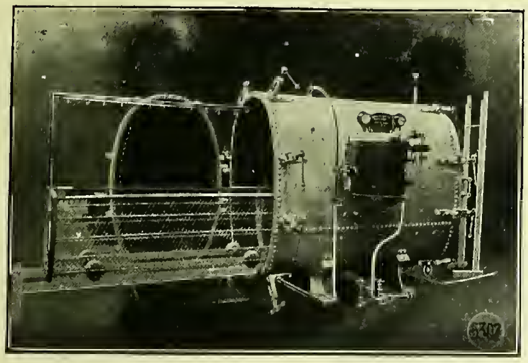
PATENTEES AND MANUFACTURERS OF

HIGH-PRESSURE STEAM DISINFECTORS,
HIGH-PRESSURE STEAM DRESSINGS STERILIZERS,
INCINERATORS, STEAM LAUNDRY MACHINERY,
AND STEAM COOKING APPARATUS, Etc., Etc.

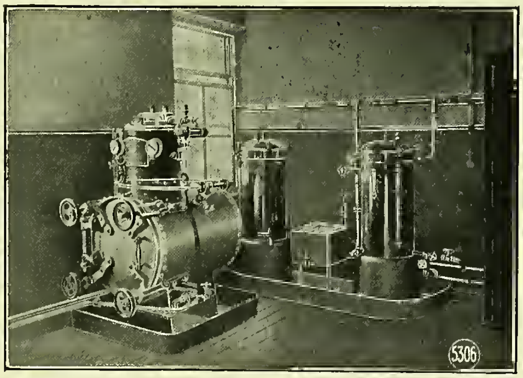
AS ORDERED BY

New King's College Hospital, London.

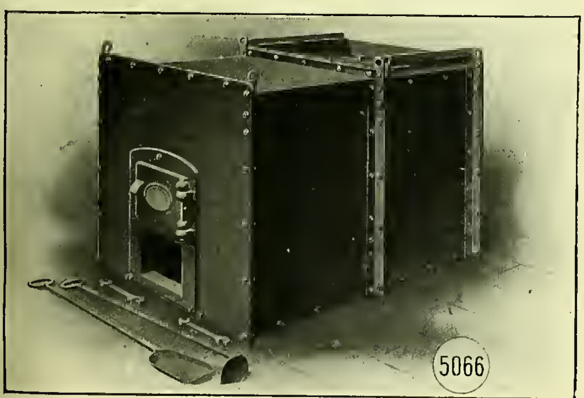
OXFORD & RADCLIFFE INFIRMARY.
MILLER HOSPITAL, GREENWICH.
THE LONDON HOSPITAL.
POPLAR HOSPITAL FOR ACCIDENTS.
CHICHESTER INFIRMARY.
NATIONAL HOSPITAL, QUEEN'S SQUARE, W.C.
EAST DEVON AND SOUTH CORNWALL HOSPITAL.
MIDDLESEX HOSPITAL.
AND THE PRINCIPAL HOSPITALS THROUGHOUT THE COUNTRY.



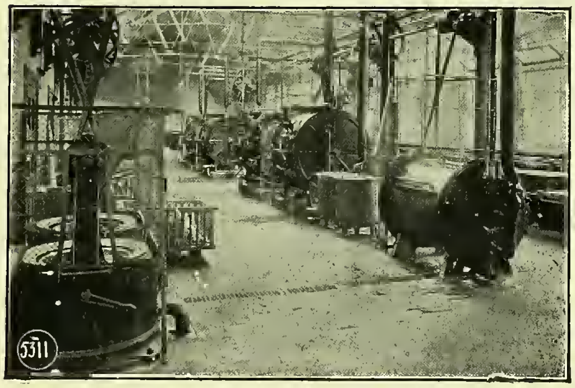
THE ALLIOTT & PATON HIGH-PRESSURE STEAM DISINFECTOR.



HOSPITAL STERILIZING ROOM FITTED UP BY M. A. & CO., LTD.



"SEMI-PORTABLE" INCINERATOR FOR BURNING INSTITUTION REFUSE, ETC.



WASH-HOUSE OF INSTITUTION LAUNDRY FITTED UP BY M. A. & CO., LTD.

WRITE FOR LISTS :—

DISINFECTORS M297
STERILIZERS M126
INCINERATORS M295
LAUNDRY MACHINERY M219

LONDON OFFICE :—

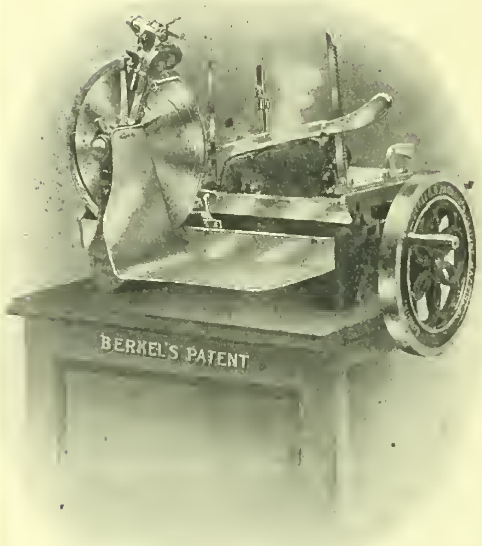
Telephone: No. 3405 Gerrard.

41—42, PARLIAMENT STREET, WESTMINSTER, S.W.

Reduced expenditure—increased efficiency

can be secured by the adoption of

BERKEL'S SLICER



Shews Machine Slicing Cooked Joint.

Slices to perfection all kinds of Meats (hot or cold), Bacon, Bread, etc., to any thickness desired.

Rapid. Safe. Hygienic.

In use at:—King's College, London, St. Bartholomew's, Queen Mary's, Monsall Fever, Cardiff, Glasgow, : : Winchmore Hill, Tottenham Hospitals, etc. : :

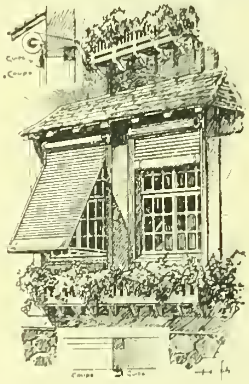
Full particulars of Institution Models on application to

Berkel & Parnall's Slicing Machine Manufacturing Co., Ltd.,
6, Bow Common Lane, London, E.

Ice-Making
AND
Refrigerating
Plants (ALL CAPACITIES).

NH$_3$ & CO$_2$ COMPRESSION SYSTEMS.

G. J. WORSSAM & SON, LTD.
ENGINEERS,
Wenlock Basin, Wenlock Road,
London, N.



"Comparison is odious,"

but where a thing is incomparable, no odium can attach.

That is the case with

Flexwood Blinds, Screens and Roller Fronts.

The Blind, Model A, is invaluable for Mental and other Hospitals in the cure of Consumption. They allow light and air to pass, but not heat.

That Flexwood Shutters are used at King's College Hospital is sufficient recommendation.

Flexwood Screens are especially suitable for sick rooms and hospitals.

Flexwood Roller Fronts can be used where there is no room for doors.

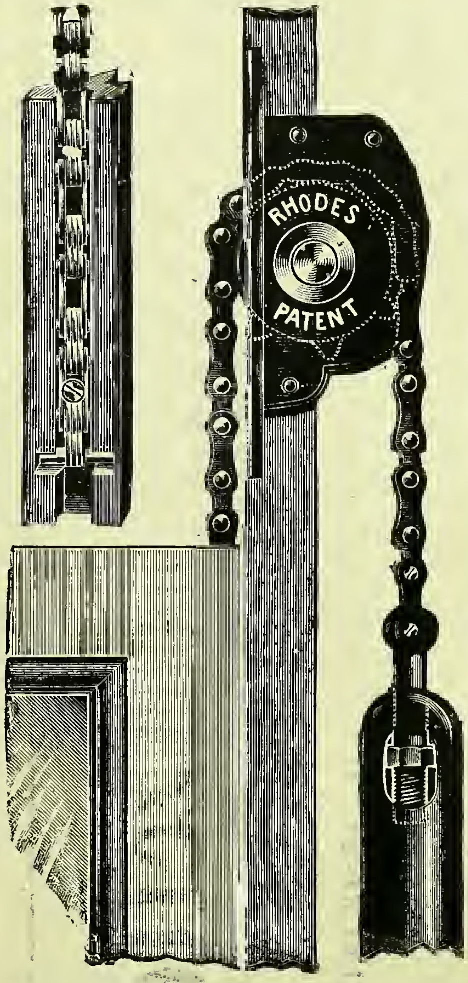
OUR H. LIST WILL INTEREST YOU.
SEND A POST CARD TO-DAY FOR A COPY TO

The Flexwood Blinds & Screens Co.
Queen's Road, Buckhurst Hill.

RHODES' PATENT SASH HANGING Co.

FAIRHOLT WORKS, STOKE NEWINGTON, LONDON, N.

Patentees and Manufacturers of Rhodes' Patent Cog Wheel Axle Pulleys (with or without ball bearings) and Sherardized Steel Sash Chains for hanging all kinds of Sliding Window Sashes, Shop Front Sashes, Lift Doors, Shutters, Blackboards, etc.; also of Rhodes' Patent Reversible Sash Fittings.



Rhodes' Patent Cog Wheel Axle Pulleys and Chains, 4,680 of these Fittings, were supplied to KING'S COLLEGE HOSPITAL.

OUR Pulleys and Chains are made in all sizes, and are composed of the best material, and are adaptable for either light or heavy work. Our chains are made of hardened steel, having a breaking strain of 1,200 lbs., and upwards, and are treated with the Sherardizing process, thus rendering them absolutely rust-proof.

All the chain is Sherardized, which is a process by which the chain is heated at a low temperature so as not to affect the temper, in closed drums with zinc dust, and becomes coated with a uniform layer of metallic zinc, which is *alloyed* into the surface of the steel.

Our Fittings are suitable for both old and new buildings, can be fixed as easily and speedily as a sash cord, as no alteration is necessary in the sash, frame, or weight. They remedy the weakness which has always been experienced in the use of the ordinary pulley and sash cord and other chains.

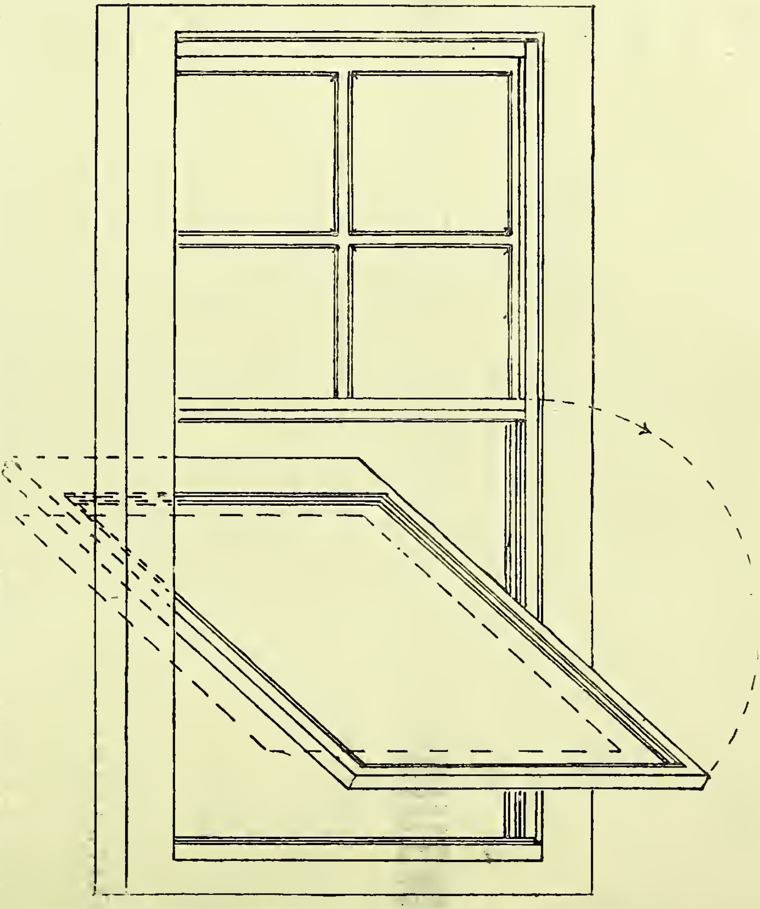
They can be used with advantage in any buildings, including:

Public Institutions,	**Schools,**
Hospitals,	**Offices, and**
Asylums,	**Private Residences.**

Rhodes' Patent Reversible Sash Fittings.

These Window Fittings possess a most important advantage over all others, viz., the Sash Stiles are locked into the Pulley Stiles of Frames while the Sashes are being reversed.

Advantages.—Economy in the maintenance of buildings by the saving of labour and material in the non-renewal of sash cords, wire, etc.; the prevention of accidents and the breakage of glass. By the use of this system, the greatest ease is obtained for opening and closing windows, doors, etc.



Rhodes' Patent Reversible Sash Fittings, 3,000 of these Fittings were supplied to KING'S COLLEGE HOSPITAL.

Rhodes' Patent Window Fittings have also been supplied during the past 10 years to all the principal Hospitals in London and the Provinces, and have given every satisfaction. Working Models and list of works executed forwarded free of charge.

The Hospital Gazette.

The Official Journal of . . .

THE INCORPORATED ASSOCIATION
OF HOSPITAL OFFICERS.

. . . A Monthly Review of . . .

HOSPITAL CONSTRUCTION, EQUIPMENT AND MANAGEMENT.

Controlled, Compiled, Edited and largely Subscribed for by—

HOSPITAL SECRETARIES, STEWARDS, ARCHITECTS, CONSULTING ENGINEERS, CLERKS OF WORKS, DISPENSERS AND OTHER ADMINISTRATIVE OFFICIALS.

ANNUAL SUBSCRIPTION, ***4/- post free.***

Postal Orders should be sent to the Honorary Manager—

Mr. W. J. DAVIDSON, Grosvenor Hospital, Vincent Square, London, S.W.

As a Medium for the Advertisements of

MANUFACTURERS OF HOSPITAL REQUIREMENTS

"The Hospital Gazette" is unsurpassed. Specimen Copy and Advertisement Tariff post free on application to

H. A. JONES, 85, Fleet Street, London, E.C.

KING'S COLLEGE HOSPITAL. The majority of the Contractors for the new Hospital are regular advertisers in "The Hospital Gazette."

Printed by Bradbury, Agnew, & Co. Ld., and Published for the Incorporated Association of Hospital Officers at 10, Bouverie Street, London, E.C.

DECOLITE

COMPOSITION FLOORING.

FOR

HOSPITALS, SANATORIA, DISPENSARIES, &c.

HYGIENIC. Tough and Hard-wearing. WARM and Elastic
to the tread. Fire-Resisting, Vermin Proof, Damp Proof.

For New Buildings, also FOR OVERLAYING EXISTING Wooden, Stone, Cement, etc., FLOORS. QUICKLY LAID.

BELL'S UNITED ASBESTOS CO., Ltd., Southwark Street, London.

Also Contractors for Mosaic and Terrazzo Pavings.

GOLD MEDAL FRANCO-BRITISH EXHIBITION, 1908.

The Whole of the Cherry Red Rubbers

for Window Heads, Gauged Work, Carving, etc.; also the

Bright Cherry Red Hand-made Facing Bricks

used in the building of

King's College Hospital

were supplied by

THOMAS LAWRENCE & SONS, of Bracknell, Berks

and are of their noted T.L.B. Brand.

THESE Rubbers and Facing Bricks have long been known as the **very best** Bricks procurable for beauty of colour, excellence of material, and good weathering properties. They are essentially suitable for cleaning down with the Steam Brush as often as desired.

¶ The firm produce the largest and most varied assortment of Mixed and Mottled Coloured Facing Bricks, in bright and dull colourings, both in ordinary London size and 2 in. thickness; also of good Sand-faced Roofing Tiles in Reds and dark colourings to match Old Roofs.

For Samples, Prices and all information, please apply to:—

THOMAS LAWRENCE & SONS, Brick and Tile Specialists, BRACKNELL - BERKS.

MATTHEW HALL & Co.,

Sanitary Specialists and Heating Engineers,

88, WIGMORE STREET, LONDON, W.

Sanitary Work and Heating of all descriptions carried out.

ORNAMENTAL CAST AND WROUGHT LEAD WORK TO ARCHITECTS' DESIGNS.

CONTRACTORS FOR SANITARY WORK AT KING'S COLLEGE HOSPITAL.

Telegrams: "Esmeralda, London." Established 1849. Telephone 1493 Paddington.

"NESBIT-EVANS"

(Birmingham)

HOSPITAL, ASYLUM, SANATORIA AND EPILEPTIC BEDS.

CLEAN. STRONG. ANTI-SAGGING.

Low Prices. Send for Catalogue.

In use at most recently furnished British and Foreign Hospitals, &c. Easily wheeled away or made rigid.

NO LOOSE SCREWS OR COMPLICATED MECHANISM.

Patent Interchangeable Bed-Inclining Stand. Either end of Bed can be raised various heights.

Awarded *GOLD MEDAL* at INTERNATIONAL MEDICAL CONGRESS for many "PRACTICAL" improvements which do not increase cost.

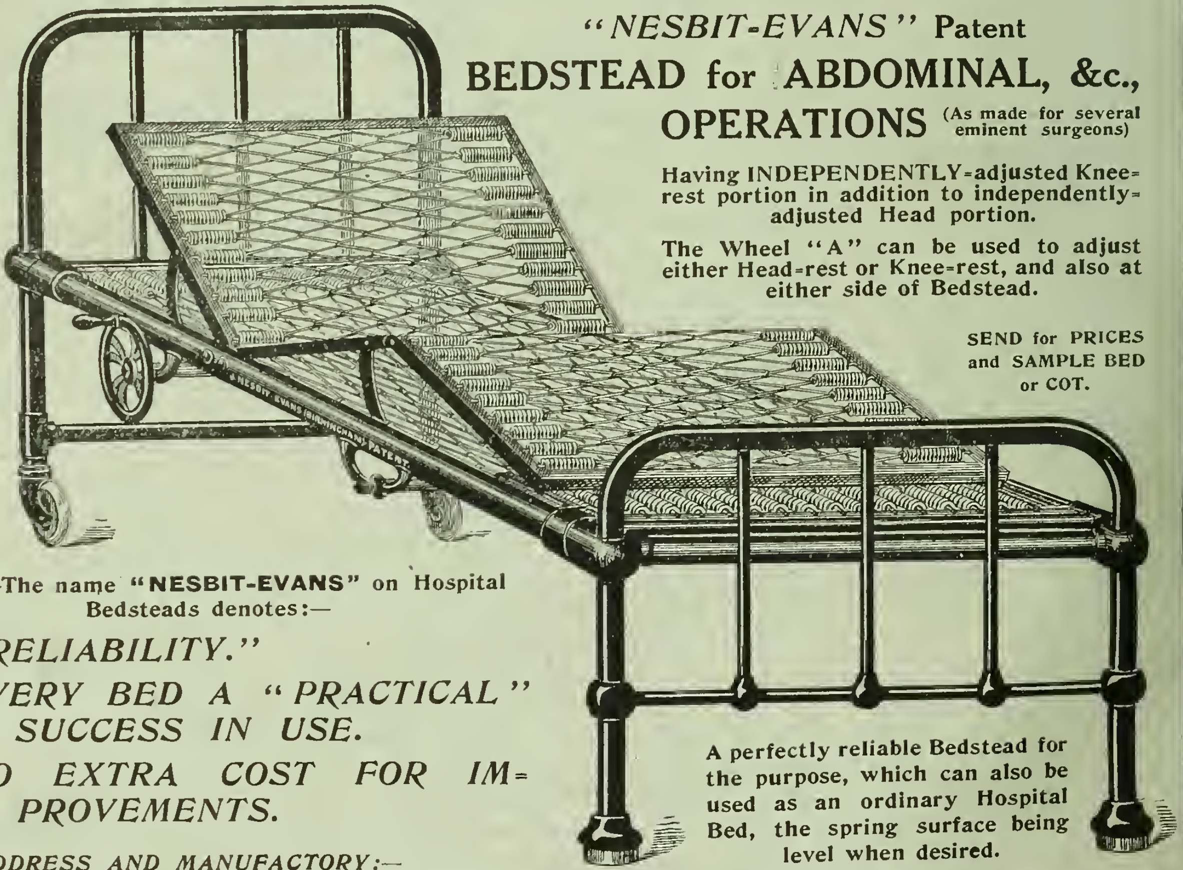
Various Designs.

Protected by various Royal Letters Patent.

BEWARE OF IMITATIONS having Cheap Steel Open Joint Tubes.

"NESBIT-EVANS" Patent

BEDSTEAD for ABDOMINAL, &c., OPERATIONS (As made for several eminent surgeons)



Having INDEPENDENTLY-adjusted Knee-rest portion in addition to independently-adjusted Head portion.

The Wheel "A" can be used to adjust either Head-rest or Knee-rest, and also at either side of Bedstead.

SEND for PRICES and SAMPLE BED or COT.

1,000 Hospital Beds and "Anti-Accident" Cots (various sizes and designs) always in stock.

NOTE.—The name **"NESBIT-EVANS"** on Hospital Bedsteads denotes:—

(*1*) *"RELIABILITY."*

(*2*) *EVERY BED A "PRACTICAL" SUCCESS IN USE.*

(*3*) *NO EXTRA COST FOR IMPROVEMENTS.*

A perfectly reliable Bedstead for the purpose, which can also be used as an ordinary Hospital Bed, the spring surface being level when desired.

ONLY ADDRESS AND MANUFACTORY:—

J. NESBIT-EVANS & CO., Floodgate Street, BIRMINGHAM.

Telephone: 6592 Central. Telegrams: "NESBIT-EVANS," FLOODGATE STREET.